AMERICAN
STATISTICAL ASSOCIATION.

NEW SERIES, No. 101. MARCH, 1913

THE NEED OF SOCIAL STATISTICS AS AN AID TO THE COURTS.*

By Walter F. Willcox, *Professor of Economics and Statistics, Cornell University.*

Of recent years and especially of recent months public opinion and political parties have been aroused, as they have not since the Dred Scot case, over certain judicial decisions and their relation to the public welfare. One outside both of politics and of law might think it prudent to be silent on this subject. But on a matter of such moment every phase of opinion is entitled to a hearing and we may have faith that "in the multitude of counsellors there is safety." Among that multitude I have heard none claiming to speak for the statistician. Believing as I do that this small but growing group has a point of view which deserves attention, I shall venture this afternoon to present and defend their position, as I conceive it.

What I have to say may be introduced with a quotation from a distinguished jurist who, in part, it may be, because of his work as a student in natural science and later his teaching of law at three great universities, has a broader outlook and more familiarity with related fields of thought than is likely to be the lot of the lawyer or judge immersed in the routine duties of an exacting profession. Professor Pound in closing a recent series of suggestive articles in the *Harvard Law Review* says: "Not a little of the world-wide discontent with our present legal order is due to modes of juristic thought and juridical method which result from want of 'team-work' between jurisprudence and the other social sciences."

* Presidential address at the annual meeting of the American Statistical Association, Boston, Mass., December 27, 1912.

The "juridical method" is primarily deductive, deriving conclusions from the principles of the law applicable to the case at bar. Philosophical jurisprudence subjects those principles to a critical analysis, discovers the large empirical element they contain, and, by showing how they alter with growing experience and with changes in the implicit political or social presuppositions upon which they are built, undermines that almost religious faith in their permanent social value common among lawyers and judges. But even philosophical jurisprudence, like a great part of economics and of sociology, as exemplified by my distinguished colleague this afternoon, devotes much time to the definition, elucidation, and criticism of terms and conceptions and to deduction from principles,—intellectual processes in which the lawyer and the judge are already trained.

If the lawyer should turn to economic history and statistics, which are perhaps the most inductive branches of social science, he would find a change in method sharply marked. The contrast between the mental characteristics exercised, on the one hand, in stating legal principles neatly and clearly and applying them convincingly to a given or assumed state of facts, and those exercised, on the other hand, in the patient investigation of the facts as they have been and are is of the widest. For this reason an intelligent and sympathetic comprehension of the methods of ascertaining social fact would be of the first value to a judge as supplementing the somewhat excessively deductive training he usually obtains from his profession.

It may be said in reply that the facts are given to the appellate court, that in previous trials they have been admitted or established and that all the judge has to do is to apply his principles. But this statement I am compelled to challenge. The very contrary is often the truth. In the great majority of decisions belonging to the class in dispute the court has by implication, if not by direct statement, passed upon questions of fact so important that if they had been differently viewed the verdict also would have been changed. In other words, my main contention is that many, perhaps most, of the court decisions which have aroused dissatisfaction and

criticism have turned on questions of social fact, and fact often imperfectly apprehended or established.

In order to avoid controverted matter at the start, I will draw my first illustration from a decision neither made by a court nor arousing any considerable dissatisfaction, that rendered by the Anthracite Coal Strike Commission of 1902–03.

One claim made before that commission by the union mine workers, the only one with which I am now concerned, was for an increase of 20 per cent. in their wages. For this claim the following reason, among others, was assigned: "The rate of wages in the anthracite coal fields is insufficient to compensate the mine workers in view of the dangerous character of the occupation in relation to accidents, the liability to serious and permanent disease, the high death rate and the short trade life incident to this employment." The Commission found and reported that anthracite coal mining "should be classed as one of the dangerous industries of the country, ranking with several of the most dangerous."

No evidence was introduced and I believe no important evidence could then or can now be found regarding the comparative liability of American anthracite coal miners "to serious and permanent disease, a high death rate and a short trade life," and yet these points seem to go to the essence of the miners' claim. In determining the total death rate and the length of trade life accidents are usually a minor factor. In the eyes of the public and probably in those of the miners they bulk much larger than the facts, if known, would warrant.

To show this, let me turn to some foreign statistics, not assuming that they would hold true for Pennsylvania, but believing they point to a line of evidence which we sorely need for this country. Let us suppose a demand for a 20 per cent. increase of coal miners' wages had been made in England, supported by similar claims, and examine the evidence there available to aid in its solution. During the years 1900–02 figures were carefully gathered showing the death rates from accidents and other causes among nearly half a million coal miners. The figures show that fatal accidents were more than twice as common among coal miners as among all occu-

pied and retired males of like age. Thus, if an inference from England to Pennsylvania were allowable, the finding of the Commission that anthracite coal mining is "one of the dangerous industries"—already well supported by Pennsylvania figures—seems confirmed. But looking to the death rate from all causes, a much more significant evidence of the length of trade life, the death rate of English coal miners at ages 25–64 was between eleven and twelve per cent. below the average for all working males. Why does coal mining, at least in England, notwithstanding the frequency of fatal accidents, seem to be a healthful occupation? Because the very high mortality from accidents is more than neutralized by the low mortality from certain forms of disease, notably consumption. How far these results would apply to anthracite coal miners in Pennsylvania, no one can tell.

The second case of which I wish to speak is the well-known bake-shop case.* The New York law under discussion was one of the earliest American statutes restricting the hours of men's labor. The work of bakers was limited to ten hours a day or 60 hours a week and the statute, although a part of the labor law, was defended and justified as protecting the health of the consumers of bread, or of the bakers themselves. Nineteen judges passed upon the statute, ten thinking it constitutional and nine unconstitutional; but, as five of the nine were members of the United States Supreme Court, the last and binding decision was adverse.

From the numerous opinions in the case it is possible to derive this general conclusion. If the occupation of a baker as then followed in the bake-shops of cities in New York was so harmful to those engaged in it or through its products was so injurious or menacing to the general health as to invite special legislation, then the statute was an admissible exercise of the police power. But if neither of these conditions was met, the statute was unconstitutional. Thus Judge Parker of the Court of Appeals wrote: "The published medical opinions and vital statistics . . . fully justify the section under review as one to protect the health of the employees"; and Justice Vann, defending the same conclu-

* People v. Lochner, 177 N. Y. 145 and 198 U. S. 45.

sion, wrote: "I do not think the regulation in question can be sustained unless we are able to say from common knowledge that working in a bakery . . . is an unhealthy employment." On the other hand, Justice Bartlett of the same court admitted that the state might regulate the hours of labor in any vocation pursued at the risk of health, but expressed his belief "that the occupation of a baker did not fall within that class" and so voted against the validity of the statute; and Justice Peckham of the United States Supreme Court in writing the prevailing opinion said: "There can be no fair doubt that the trade of a baker in and of itself is not an unhealthy one to that degree which would authorize the legislature to pass such a statute." Other justices, like Harlan and Holmes, upheld the statute on the ground that whether the occupation was healthful or unhealthful was a question of fact upon which the court should accept the opinion of the legislature implied in the passage of the law. On the whole, a study of the opinions warrants a belief that the law would have been held constitutional by every one of the judges if either of the following conditions had been met: if the judge had accepted the opinion of the legislature affirming the unhealthful character of the baker's occupation as conclusive; or if, on independently reviewing the evidence offered in support of that conclusion, he had found it convincing.

This decision thus turned on a question of fact. Upon that question the evidence cited by the judges consisted of a series of opinions from medical writers and vague references to vital statistics. Mulhall's *Dictionary of Statistics*, that *bête noire* of careful statisticians, was cited four times. I doubt if any member of this Association would hold that the evidence mentioned in the numerous opinions of the judges warranted a confident answer either affirmative or negative to the question, Was the occupation of a baker in the cities of New York state a very unhealthful one?

If a similar question had arisen in England the answer to it would have been clear and probably convincing, The death rate of bakers 25–64 years of age in 1891 and in 1901 was to the death rate of all males at the same ages as 92 is to 100; in other words, the occupation was somewhat more

healthful than the average. During the decade 1890–1900 the death rate of bakers fell, the improvement being greatest in the case of consumption and diseases of the respiratory system. Whether similarly a low death rate and rapid improvement in the health of bakers in this country or in New York state would appear, if the facts were known, no one can safely assert. The even division of the judges arose largely from the circumstance that most of them felt bound to reach a conclusion of fact when the evidence was inconclusive and about equally balanced.

The third and last case of which I wish to speak is the one in which the New York Court of Appeals last year unanimously held the Workmen's Compensation Act of 1910 unconstitutional.*

The statute was based upon a classification of occupations under which eight especially dangerous kinds of employment were selected for protection by a new system of compensation in case of accident. To this classification no serious objection was raised by the court. The central question decided in this case, as in the bake-shop case, was that the statute was not a legitimate exercise of the police power, that is, "the power of promoting the public welfare by restraining and regulating the use of liberty and property."† On this point the court said that the statute "does nothing to conserve the health, safety or morals of the employees," and, elsewhere, that it "contains not a single provision which can be said to make for the safety, health or morals of the employees." From the context of these passages we may infer that if the court had taken a different view, if it had believed that the statute did make for the safety or health of the employees, it would have decided that the statute was a valid exercise of the police power and constitutional.

Now the striking thing about these positions of the court, like those in the other two cases, is that they are not conclusions of law but statements of fact. As such it requires no special training in the law to examine them.

The United States is believed to have an extremely high accident rate, but our statistics to confirm or correct the

* Ives v. South Buffalo Ry. Co., 201 N. Y. 271.
† Freund, Police Power, p. iii.

opinion are meager, if not inconclusive. One of the main purposes of the law declared unconstitutional was to lower that accident rate in those industries as well as to assure compensation. The court seems to assume without giving its reasons that this purpose would not be realized. The general testimony of students of accident statistics in foreign countries, where legislation aiming at the same end has for years been in force, is to the effect that the proportion of accidents to one thousand employees has increased, that the proportion of serious accidents to one thousand employees has been stationary or has decreased but that this decrease, if it existed, has been offset or more than offset by the apparent increase of minor accidents. Thus an examination by Dr. H. J. Harris of the accident statistics of Germany, Austria, and Great Britain, published in the Quarterly Publications of our Association for last March, concludes that "the progress in the movement for reducing the risk of industry has resulted in distinctly reducing the risk of death or permanent disablement, but has not yet diminished the risk of temporary disablement.* I quote also the statement of M. A. Fontaine, the French Director of Labor, presented a few weeks ago before the International Congress on Hygiene and Demography at Washington: "If, in order to eliminate the influence of the increase of the number of workmen, one refers the numbers of accidents to one thousand workmen, it is apparent that there has been [*sc.* in France] no increase in severe accidents, that the actual danger of the industries has not augmented, but that there is a characteristic and important increase of minor accidents. This change is attributed to the increasing care with which accidents are reported and still more to the legal modifications which influence the workmen to prolong short, temporary disabilities in order to get their remuneration."† The usual and probably the correct explanation of this fact in other countries also is that many minor accidents formerly were not reported at all but now are registered. If this explanation be accepted, then the ten-

* Quarterly Publications of the American Statistical Association, Vol. XIII, p. 27 (March, 1912).

† Abstracts of Papers at International Congress on Hygiene and Demography, pp. 284, 285.

dency in foreign countries has been towards a real decrease of serious accidents and perhaps towards a real decrease of all, though not of reported, minor accidents. On the same point the opinion of the commission recommending the law appears in the following sentence of its report signed by thirteen of the fourteen members. "It is the opinion of a great many of the employers testifying before us on the subject that the compensation system will have the effect of making the employers more careful and with that we agree, nor does it seem in any way probable that the compensation system would have any effect on making workmen careless."* This opinion of the Commission was in line with evidence showing that under the present system in three eighths of the cases of fatal accidents investigated nothing was paid to the surviving representatives of the deceased, in one eighth only the funeral expenses were paid, and in nearly three eighths more the payment was less than $500. In cases of partial disability, temporary or permanent, the proportion receiving no compensation was even higher. This evidence, carefully considered by the Commission and presented in its report, seems fully to justify its opinion. If the amount to be paid out by employers for accidents were to be increased several times, as the proposed system would do, the motives leading the employer to try to diminish the number of such accidents would be correspondingly strengthened.

The conclusion of the New York Commission has been recently supported by that of the Massachusetts Commission on Compensation for Industrial Accidents. It recommended an elective compensation law and with the New York decision in hand it unanimously rejected the conclusion of that court regarding the effect of such legislation upon the safety and health of employees and reported the following finding: "No one can study the history of this subject in other countries without being impressed by the fact that the operation of compensation laws in several of them has materially reduced the number of injuries in factories and workshops, especially those resulting from machine operation."† On the basis of

* First Report., New York Commission, March 19, 1910, p. 56.

† *Report* of the Massachusetts Commission on Compensation for Industrial Accidents, July 1, 1912, p. 46.

this experience as well as other evidence, the Massachusetts Commission added: "Under the terms of the new law . . . the employers will realize that it is of the utmost consequence in a financial as well as a humanitarian way to prevent the injury. It is believed that it will be possible to decrease very largely the number of accidents and this aspect of the law is regarded as its most important part."*

The New York Court seems to believe that an indirect method of decreasing the number of accidents, namely, by increasing the employer's pecuniary interest in preventing them, is unjustified. It hardly realizes that in securing social change indirect methods are often the most effective. The opinion of the legislature, also, that the new law would diminish accidents seems to be clearly indicated by its passage of the bill. We have then, upon one side of this issue of fact, the conclusion of statisticians regarding the probable effect of similar laws in foreign countries, the conclusion of the New York Commission and the Massachusetts Commission and the statistical evidence upon which they based that conclusion, and the opinion of the legislature which passed the law, and upon the other, the unanimous decision of the New York Court of Appeals.

Another line of evidence also leads to the belief that the decision in question is entitled to scant consideration except from such courts as are bound to accept it as authority. The evidence is rather psychological than statistical, but still it may be sanctioned as supporting the argument that courts are ill adapted to deal with these questions of social fact and that a speedy development of sound statistical work in this field is of capital importance for courts, judges, and legislatures.

If a statute passed in the exercise of the police power is attacked as unconstitutional, the court usually admits the existence of a presumption in favor of its constitutionality. As Justice Harlan put it in his dissenting opinion on the bake-shop case: "If there be doubt as to the validity of the statute . . . the courts must keep their hands off, leaving the legislature to meet the responsibility for unwise legis-

* *Ibid.*

lation." A court approaching such a question and feeling bound to review the judgment of the legislature might be expected to describe briefly the existing conditions, the evils which the statute was designed to remove, and the changes that had resulted or would result from it, before approaching the discussion of the constitutional objections to the new system. In that discussion an obvious desire to find the law constitutional would be natural.

In the present case the opinion begins with a paragraph reciting the facts and praising "the industry and intelligence of this Commission." The second paragraph begins the argumentative part with a most significant sentence: "The statute, judged by our common-law standards, is plainly revolutionary." On the lips of a lawyer and judge fifty-seven years of age the word "revolutionary," like the word "socialistic," is a term of reproach or opprobrium and not of argument. With his opening sentence as a clue to the writer's frame of mind, the following phrases scattered through the opinion gain new meaning: "the radical character of this legislation," "this departure from our long-established law and usage," "this indictment of the old system," "the new statute is totally at variance with the common law theory," "the theory is not merely new in our system of jurisprudence but plainly antagonistic to its basic idea." From these passages one not familiar with the law would be almost sure to infer that there is a strong legal presumption against a "revolutionary" statute "totally at variance with the common-law theory." A careful reading of the decision shows that the court at another point of its discussion grudgingly admits what I take to be unquestioned, that the legislature has the right to revolutionize the common law, If so, the common law no more furnishes any standard by which a statute changing it should be judged, than the decision of a lower court furnishes a standard by which the reversal of its decision by a higher court should be judged. Then what is the use of this lengthy discussion of the common law theory? Apparently it reveals a frame of mind somewhat like this, The statute is so totally at variance with the common law that it probably violates also some underlying constitutional provision. And to that conclusion the court comes when it

says: "With all due respect to the members of the commission, we beg to observe that the statute enacted in conformity with their recommendations does not stop at reversing the common law; it attempts to reverse the very provisions of the Constitution." And the court finds it unconstitutional because it is not a health law, or in its own words: "This statute . . . contains not a single provision which can be said to make for the safety, health or morals of the employees." The evidence already presented seems to indicate that it was a health law in the sense that its intended effect was, and probably its actual effect would have been, to diminish or check the increase in the number or proportion of accidents in the industries affected.

These three cases agree among themselves and represent many others in that each tribunal passed upon an important question of fact involved with the questions of law and in so doing decided the case. Each was a question of social fact, or fact about a group average, the average duration of trade life, the average healthfulness of an occupation, the average effect of a given method of compensation upon the frequency of industrial accidents.

Even if the view taken by many judges should finally be accepted by all courts and the decision of these questions of fact made by the legislature in enacting a statute should be left in all but extreme cases without judicial review still the difficulty of drawing a line between these extreme cases and other cases would be no less serious, though it might arise less often. If the court should refrain, the decision of the legislature would be final.

If an appeal on such questions of fact from the decision of the state court of last resort to the voters were permitted, as has been proposed, the voters would face the same problem.

With whichsoever of these three,—legislature, court, or people,—the final decision rests, there is great and growing need of perfecting our agencies for ascertaining social fact and of these in my judgment the main one is social statistics. It is the lack of convincing social statistics upon such problems which has made it impossible to answer with confidence many of the questions judges and legislatures have assumed or felt bound to answer.

It might be said that the need for statistics is not clear, that the brilliant work of Mr. Brandeis in defending the Oregon ten-hour law for women, which illustrates just what is needed, is far from statistical. Such work was probably the best that could be done under the conditions, but in many fields it could not be duplicated and like any collection of opinions it is open to challenge as mere opinion. Even expert opinion is a poor substitute for an inductive and exhaustive study of the fact.

Our political mechanism for the inductive determination of social fact is immeasurably inferior to our mechanism for deductive application of legal principles to assumed states of social fact. Many courts, wisely or unwisely, have felt bound to review and decide upon such issues of fact and in doing so have often traversed the judgment of the legislature and sometimes of the public and at the same time have revealed a lack of desire or ability to investigate for themselves or do more than weigh the evidence submitted by the parties in the light of their own convictions or impressions. Such cases are sure to multiply and the criticism of the courts aroused by their decision seems likely to increase.

In such cases a developed system of social statistics should ascertain the facts and present them in a convincing way. It should render upon these multiplying questions of social fact somewhat the service that the jury system does upon questions of individual fact. Our methods of ascertaining social fact are on the whole less developed than in any other great industrial country; more and more our courts are finding it necessary to decide such questions of fact; our national attitude towards the courts is apparently changing from one of perhaps extravagant laudation to one of perhaps excessive criticism. These facts seem to me to be interdependent. The ascertainment and proof of the social facts should not be left to the individual parties to whatever suit may arise. The facts in the case at bar may be anything but typical and it is by typical, representative, or average facts that the court should be guided to a decision. Into this field of exploration our American statistics seem destined to advance and by so doing to supplement a defect in our judicial system.

PROCEEDINGS OF THE SEVENTY-FOURTH ANNUAL MEETING OF THE AMERICAN STATISTICAL ASSOCIATION, BOSTON, MASS., DECEMBER 27-31, 1912.

The seventy-fourth annual meeting of the American Statistical Association was held in Boston, Mass., December 27-31, 1912. Several other associations held their annual meetings at the same time and place. The following program was carried out with some slight changes:

PROGRAM.

FRIDAY, *December* 27.

4 p. m. *First session*, Huntington Hall, 491 Boylston Street.
Joint session with the American Sociological Society.
Presiding officer, Dr. Richard C. Maclaurin, President of the Massachusetts Institute of Technology.

Presidential Addresses:

Albion W. Small, Chicago University, President American Sociological Society. "Modern Tendencies in Social Science."

Walter F. Willcox, Cornell University, President American Statistical Association. "The Need of Social Statistics as an Aid to the Courts."

SATURDAY, *December* 28.

9 a. m. *Second Session*, 16 Rogers Bldg., 491 Boylston Street.
Annual Business Meeting.
Reports of Officers and Committees.
Election of Officers for the Year 1913.

10.30 a. m. *Third Session*, 16 Rogers Bldg., 491 Boylston Street.

1. State Supervision of Municipal Financial Statistics. Charles F. Gettemy, Director, Massachusetts Bureau of Statistics.
2. Statistics and Politics. Leroy D. Peavey, Vice-President, Babson's Statistical Organization, Wellesley Hills, Mass.

2.30 p. m. *Fourth Session:*
Round Table Meeting at the South End House, 20 Union Park.
The Compilation of Urban Population Statistics by Small Local Areas.
Introductory Remarks, Walter F. Willcox, President of the American Statistical Association.
The Need of Such Statistics, Roberts A. Woods, Head of South End House University Settlement.

Discussion:

E. Dana Durand, Director of the Census.

Lawrence Veiller, Secretary and Director, National Housing Association.

10.00 p. m. Smoker at the Boston City Club, 9 Beacon Street.

MONDAY, *December* 30.

10.00 a. m. *Fifth Session*, Seaver Hall, Harvard University.

Some Recent Changes in the Composition of the Population of the United States. William B. Bailey, Supervisor of the Census for Connecticut.

Some Possibilities in the Practical Application of Census Results. William S. Rossiter, formerly Chief Clerk of the Bureau of the Census.

12.30 p. m. Luncheon offered by Harvard University.

5.00 p. m. Reception by President and Mrs. Lowell.

8.30 p. m. Club Night at the University Club.

TUESDAY, *December* 31.

1.00 p. m. Subscription Luncheon, with brief addresses, at the Copley Plaza.

MINUTES.

Room 16, Rogers Bldg., Massachusetts Institute of Techology, December 28, 1912.

The meeting was called to order at 9.30 a. m. by President Walter F. Willcox.

The reports of officers were then called for.

SECRETARY'S REPORT.

Mr. President and Members of the Association:

I have the following to report in regard to condition of the Association:

Membership December 29, 1911, date of last annual meeting		623
New members added		47
		670
Deaths during the year	3	
Resignations	21	
Dropped	12	
Total deductions	—	36
Present membership		634
Net gain	11	

Beside members we have:

Subscribers (mostly libraries)	166
Domestic Exchanges	36
Foreign Exchanges	114
Total mailing list	950

The following members have died during the year: Hon. Theodore C. Bates, Prof. Frederick C. Moore, and Isadore Strauss.

Four numbers of the quarterly publications have been issued during the year, containing an aggregate of 362 pages, or an average of 90 pages per number.

Only one quarterly meeting has been held during the past year. This took the form of a luncheon in honor of the official foreign delegates to the Fifteenth International Congress of Hygiene and Demography and was given in the Oak Room, Hotel Raleigh, Washington, D. C., September 24, 1912.

Two attempts have been made to hold a quarterly meeting in New York City. It is hoped that such a meeting can be held sometime this winter. In order to facilitate the arrangement of meetings for the large and growing membership of the Association in and about New York, I would recommend the election of an assistant secretary for that city. This plan has worked well in Washington during the past two years and should be continued and extended to other centers as soon as the number of local members warrants it.

Respectfully submitted,

CARROLL W. DOTEN,
Secretary.

On motion it was voted to accept the report of the secretary and to make it a part of the published proceedings of the meeting.

Treasurer's Report.

December 22, 1911, to December 24, 1912.

RECEIPTS.

Membership Dues	$934.20	
Sales and Subscriptions	617.09	
Dividends and Interest	159.92	
Balance on hand December 22, 1911	390.40	
		$2,101.61

EXPENDITURES.

Printing	$1,309.28	
Postage	139.02	
Salaries and clerical service	321.00	
Expenses	29.63	
	$1,798.93	
Balance on hand, December 24, 1912	302.68	
		$2,101.61

ASSETS.

17 shares B. & A. R. R. Stock @ 213 ..... $3,621.00

S. B. Pearmain,
Treasurer.

Auditors' Report.

Boston, December 26, 1912.

We have this day audited the accounts of the Treasurer of the American Statistical Association, for the year 1912–to December 24, 1912; and counted the securities in his possession. We find the accounts accurately stated and the expenditures properly vouched.

Receipts and expenditures may be stated as follows:—

1912.

RECEIPTS.

Balance in bank January 1, 1912	$441.14
Receipts from dues	928.20
sales	617.09
dividends and interest	114.58
Total	$2,101.01

EXPENDITURES.

For printing	$1,309.28
salaries	321.00
postage	139.02
miscellaneous	29.03
Total	$1,798.33
Balance in bank	302.68
	$2,101.01

Assets, 17 shares of Boston and Albany R. R. stock.

EDWARD M. HARTWELL,
ROGER W. BABSON,
Auditing Committee.

On motion it was voted to accept the treasurer's report and the report of the auditors and to print these reports in the proceedings of the meeting.

On motion it was voted that the secretary in consultation with the president and editor be empowered to select and appoint an assistant secretary residing in New York City.

An informal oral report was made by President Willcox for the Committee on Constitution and By-Laws.

President Willcox reported also for the special committee on Fellows, which was elected at the Washington meeting and instructed "to carry the provisions of Article IV of the Constitution into effect," that this committee had been unable

to reach an agreement. After a somewhat lengthy discussion it was voted to empower the president to appoint a committee of five to prepare a list of candidates for the title of Fellow, to be reported to the next annual meeting of the association. The following were appointed as such committee: Frederick L. Hoffman, S. N. D. North, Allyn A. Young, S. H. Wolfe, Carroll W. Doten.

The Committee on Nominations, consisting of Frederick L. Hoffman, Charles F. Gettemy, and Louis N. Robinson, reported the following list of officers for the ensuing year:

President, John Koren; vice-presidents, Henry W. Farnam, E. Dana Durand, Charles P. Neill, Henry B. Gardner, Henry R. Seager; librarian, Horace G. Wadlin; treasurer, S. B. Pearmain; secretary, Carroll W. Doten; assistant secretary, Emil P. Secker; counsellors, S. N. D. North, Frederick L. Hoffman, Walter F. Willcox; editor, William B. Bailey; associate editors, Frederick S. Crum, Henry J. Harris, Leonard W. Hatch, Warren M. Persons; committee on finance, Edwin W. DeLeon, Miles M. Dawson, S. B. Pearmain; committee on library, Charles F. Gettemy, Roger W. Babson, F. Spencer Baldwin.

As there were no other nominations it was moved and seconded that the secretary cast on ballot for the entire list of nominees. This motion was unanimously adopted and the officers were declared elected.

On motion it was voted to adjourn the business session until Monday, December 30, at 10 a. m., and to proceed at once with the literary exercises.

Adjourned Meeting.

Harvard University, December 30, 1912.

The meeting was called to order at 10.30 a. m., by President Willcox.

It was voted to hold the next annual meeting of the association in Boston. This meeting will be the seventy-fifth annual meeting of the Association, and a program will be arranged to fittingly celebrate this anniversary of the founding of the Association.

The Board of Directors of the Association were empowered

to make the necessary arrangements for this meeting and to report progress at such quarterly meetings as may be held during the year.

On motion the secretary was instructed to respond to the numerous invitations received by the Association to hold its next annual meeting in other cities and to express the regrets of the Association that they could not be accepted.

It was voted to inform the officials of the Panama Exposition that their invitation for 1915 will be carefully considered and the matter will be determined at a later date.

The secretary was instructed to express the thanks of the Association to the Massachusetts Institute of Technology, Harvard University, the Boston City Club, the University, Club, and the St. Botolph Club for the courtesies extended to the Association and to its members during the period of the meetings here in Boston.

The president appointed LeRoy D. Peavey and Roswell F. Phelps as a committee to audit the books of the treasurer for the next annual meeting.

The meeting adjourned for the scientific session at 10.50 a. m.

CARROLL W. DOTEN,
Secretary.

THE FUNCTION OF THE STATE IN RELATION TO STATISTICS OF MUNICIPAL FINANCES.*

By Charles F. Gettemy, *Director of the Massachusetts Bureau of Statistics.*

The relation of the state, in our American system of government, to municipal functions, and the origin and development of the various forms of supervision and quasi-jurisdiction which have from time to time been assumed by the states over the administration of municipal finances, have never been made the subject of adequate historical treatment, partly, no doubt, because of the inaccessibility, but chiefly because of the unreliability, of the sources of original information on the subject. It is not my purpose in this brief paper to attempt even a summary of the material which research in this inviting field may uncover, but only to indicate certain significant phases and tendencies of the modern movement for state supervision of municipal finances which had its origin about eighteen years ago and has now achieved an appreciable momentum in about a dozen states of the Union, and to do so with special reference to emphasizing its statistical importance and possibilities.

Six centuries ago, Dante, who, besides being a great poet, accepted an appointment without pay to superintend the straightening, widening, and paving of the street San Procolo, likened his beloved Florence to the sick man who finds no rest upon his bed and turns from side to side to ease his pain. So with our American cities,—every now and then, when his distress seems no longer endurable, the patient seeks relief in some temporary remedy, such as the driving of men thought to be rogues from public office, or the enactment of a new charter. It is a familiar story,—the sporadic character of reform movements in our municipal politics, their absolute failure to outlive the enthusiasm of good citizens temporarily aroused from lethargy by a culmination of

*Paper read at the annual meeting of the American Statistical Association, Boston, Mass. December 28, 1912.

corruption and inefficiency thought to be no longer endurable, and then the lapse once more into indifference, cynical acquiescence, and impotent despair. "Reformers," as Mr. Metz, formerly comptroller of New York City, has recently put it, "seem on a perpetual quest for some short cut from misgovernment to efficient government."

So it has come about that the students of city problems who have gone beneath the surface of things and down to the foundation of municipal misrule are beginning to appreciate, in the highly important work of making democracy in our cities a success, that while we need character and honesty and willingness in our public officials, we need something perhaps even more than these, namely, precise classified knowledge of our public affairs. Give us the most capable administrator whom it is possible to find and one whose integrity as well as ability is unquestioned, and what can he accomplish—how much have we a right to expect him to accomplish—when he is deprived of the most important tool he should have to work with; and when we have, moreover, deprived ourselves of the instrument necessary for measuring and judging conditions and deciding what ought to be done about them?

It seems to me that the corner-stone of efficient municipal administration is exact statistical information, compiled so as to reflect: (1) The thoroughness with which taxes are assessed; (2) the faithfulness and industry with which revenue is collected; (3) the extent to which adequate service is rendered for expenditures. Such information obviously can be obtained only with great difficulty, if at all, in the absence of system and accuracy in accounting procedure and without an exact use of words and phrases, a uniform terminology throughout all departments and, as far as practicable, in all municipalities. While, therefore, I would be the last person to minimize the importance,—indeed, the absolute necessity,—of a thorough overhauling and reorganization of accounting methods as the *sine qua non* of any enduring reform in municipal administration, I desire on this occasion to call attention to the fact that while an accounting system which will adequately record the financial transactions of each particular

community is of fundamental importance, there is some danger that to carry out such a system may be regarded as a bookkeeper's task solely, involving merely proper recognition of the principles and technique of accounting; and that the latent possibilities of an intelligently kept system of accounts as a means of directly promoting efficient municipal government in all its countless ramifications (health conservation, protection of persons and property, education, charity, recreation, etc.) may not be fully appreciated by our local accounting officers.

The development of these possibilities involves something besides the ability merely to keep books that will balance correctly, something, indeed, besides the ability to keep a complete and detailed record of all of a city's financial transactions. The information thus entered with pen and ink on cash books, journals, and ledgers must, in order to be of the highest value to progressive administrators and students of municipal affairs, be reflected in the printed and published reports in such form that its significance may have a ready application and be clearly comprehended by the citizens and taxpayers. There is poor enough municipal accounting in great abundance, alas, but there are also many excellent accounts kept by men who appear to be quite unable to translate and summarize the facts they have recorded, I might say imbedded, in original books of entry and to transfer them to the printed page with any approach to intelligible form; and we have as a result a great output of public documents which ought to be mines of valuable information, but which are wastes of dead matter, useless alike to administrative officers and citizens, not so much because the statements they contain are inaccurate,—though inaccuracies are by no means absent,—as because they are lacking in systematic arrangement, the detail is poorly classified, and comprehensive summaries are not attempted, faults which are almost certain to mislead the reader and render intelligent interpretation next to impossible. Sixteen years ago Mr. Frederick R. Clow graphically described conditions then existing, upon which, happily, some improvement has since

been made in numerous important individual cases, but which still prevail generally the country over:

"There are tons of auditors' and comptrollers' reports, treasurers' statements, debt statements, estimates, appropriation ordinances, proceedings of councils, mayors' messages, department reports, law and judicial decisions, besides endless newspaper and periodical literature. But its crudity is appalling. City documents seem to be compiled to meet the requirement of the law or to make a job for the city printer, —anything except to give intelligible and desirable information. . . . In so far as the municipalities of a state are left to themselves, they tend to have individual peculiarities. Thus, in studying local finance, we have a myriad of financial systems to take into account."

The ideal municipal accountant should, therefore, not only possess accounting ability in the usual acceptance of the term, but should cultivate, if he is not naturally endowed with it, the imagination of the statistician. It may as well be admitted at once, however, that the combination of these characteristics in a single individual is too much for us to hope to find in all of our municipalities for a long time to come. Partly for this very reason, it seems to me that if the authority of the state is to be invoked to assist our towns and cities to govern themselves, its highest and ultimate function in this field should be primarily educational and informatory through the dissemination of statistical data, carefully gathered and compiled upon as uniform a basis as possible for comparative and analytical purposes, and that its exercise of supervisory powers over municipal finances should be, in the last analysis, incidental only.

It must, I think, be conceded that certain legislative enactments,—special laws, as well as those affecting all municipalities of the state,—such as provisions to regulate the incurrence of indebtedness, the essence of which is to protect the taxpayer of the future against burdens that might otherwise be unjustly placed upon him, must be subject to enforcement by the state's own officers. Such assistance, also, as the state can render in pointing the way to improved accounting methods and, in the interest of all the taxpayers, in encour-

aging local officials to adhere to sound principles in the handling of their financial problems, it should be prepared to give; and I am of the opinion, based upon experience, that the exercise of these functions on the part of the state will not only come to be recognized as legitimate, but will be most cordially welcomed by the municipalities themselves. But beyond this fairly distinct line the state should be exceedingly careful about trespassing and should leave to its several municipalities, in proper deference to the spirit of local self-government and responsibility, as wide a field as possible for the exercise of individual initiative and development.

I think I can see indications that the time is not far distant when scientific accounting systems, measurably well kept, will have become the rule in our municipalities and will be regarded as a commonplace adjunct of their every-day life, quite as essential to the public welfare as certain more visible assets, such as good roads, good schools, adequate water supplies, parks and playgrounds, hospitals, etc. We must, accordingly, look beyond the mere installation of scientific accounting systems and the handling of local financial problems in accordance with the letter of the law to a time when accounts and records of financial transactions may be put to a wider public use and when they will be regarded not only as an achievement in themselves, but, incidentally, as a means to a much larger end. In a word, while accounts and records should reflect current facts and transactions with routine accuracy and completeness as a matter of necessary contemporary record, they should do so in such a manner as to make possible their easy translation into public documents from which may be determined the degree of administrative efficiency with which our municipalities are governed. It is perhaps, as I have said, too much to hope that even our best municipal accountants can all be so gifted with the imaginative faculty as to be able to make of their printed reports much more than transcripts of the figures on their original books of entry; but if the state cannot keep the books of our municipalities,—something which it ought not to undertake even if it were not a physical impossibility,—it can, at least, supply the statistical faculty and by means of a depart-

ment or bureau equipped with a staff trained in the observation and interpretation of facts, take data which have been properly recorded and assemble and correlate them in such form as to render them of immeasurable importance in promoting efficient internal administration of municipal affairs as well as of direct service to the economist and student of political science in its larger aspects.

It is at this juncture that a new and almost unexplored field for statistical endeavor is revealed, which affords the statistician a limitless opportunity for usefulness in the adjustment, if not the solution of, some of the most troublesome economic problems of our time, since outside the immediate relationship of capital and labor in the industrial field, there is scarcely one of these questions which does not come into contact with municipal government through its financial administration at some vital point, so that, as Professor Bullock has well said, "while this movement is to be commended as of great practical value for the improvement of the financial standing of our cities, it has far-reaching importance when we look upon it as a movement for gathering data essential to enable the student of modern social conditions to determine whither our civilization is tending and whether it is likely to prove a failure or success." What are some of these questions upon which the economist in political science would like to be able to throw more light than it has hitherto been possible for him to do because of a lack of adequate primary data such as can only be supplied him by the statistician and the gathering and compilation of which accordingly constitutes the latter's great opportunity? What, in short, do we need to know with respect to certain aspects of public finance and its connection with the economic well-being of the community, in regard to which we are either very ignorant, or, at best, have only vague conceptions based upon isolated, uncorrelated, and, too frequently, unverifiable data?

There is a vast literature of taxation, whole libraries have been written in support of various theories of raising revenue; and there is a great body of statutory enactments prescribing the manner in which funds shall be raised for the support

of the public service,—national, state, and local,—the administration of which has resulted almost automatically in the accumulation of a great quantity of data upon which the student of taxation may draw for statistical information of a tolerably enlightening character. And this is but natural, since the laws of taxation from which our local communities, as well as the states, derive their general revenues, are state laws; and the state being the taxing power, it must have in its possession at all times, accessible through a central administrative office, records which reflect the degree of success attained in the operation of its statutory requirements. But until the movement for the standardizing of local accounting methods under the direction of some central official began to make headway, there was nowhere to be obtained in any of our states information which threw any adequate light on municipal expenditures, a condition primarily and obviously due to the fact that while there were laws in abundance governing the raising of revenue, there was practically no legislation regulating local expenditures. With the latter, the state appeared, and, indeed, at the present time appears to have little or no concern, partly, no doubt, out of respect for the doctrine that, given the means of raising revenue for their immediate desires, the people should be permitted to spend it to suit themselves, but primarily, I imagine, because the state does not approach the question of expenditure from the same point of view as does the individual. The state must, in being obliged to supply service to all the people, take into account numerous factors with which he who buys only for his own needs or for the purpose of personal profit does not have to reckon. The theory of personal expenditure to which the individual must in the long run adhere is that he cannot spend more than his income and he must accordingly adjust his scale of living to his financial receipts; the state, on the other hand, first takes an account of what its lawmakers conceive to be its needs, and then proceeds to raise the amount required to meet those needs.

Whether it is any part of the true function of the states in our American system of government to undertake super-

vision over municipal expenditures by means of restrictive legislation,—except through the limitation of the borrowing power, which seems to be both legitimate and necessary,—I have grave doubt; at any rate, the discussion of this question is not within the province of this paper. I merely wish on this occasion to emphasize the conviction that, however well-founded the opposition to any scheme of state supervision over local expenditures may be, there is an urgent need in the conditions of modern life for the assumption by the state of the duty of collecting and disseminating positive and accurate information on the subject, and that if it can thereby furnish our local communities with needful publicity about their own affairs which can be of assistance in increasing their own efficiency in governing themselves it can render no higher service.

The tendency of the people to concentrate in cities is one of the most impressive economic phenomena of the last 100 years and is emphasized with each recurring census. The problem of efficient municipal government is accordingly constantly becoming more and more acute, and in America, at least, it has forged to the front during the past decade with a degree of insistence quite out of proportion to the accumulation of data essential to its proper study. It is of the utmost importance that we know just to what extent increasing population and increasing concentration of population are keeping pace with increasing expenditures for municipal purposes, and whether the latter are increasing disproportionately compared with valuations which are the basis of taxation. No elaborate research is required to assure us that there is continually going on all about us a broadening of the scope of municipal functions, a fact which, in the absence of definite data, is often plausibly offered as an adequate explanation of rising expenditures; now we want to know to just what extent the increasing cost of municipal government is properly attributable to this cause and whether the assigned cause is in any respect a cloak for wasteful or improper expenditures. We want to know, furthermore, in what particular branches of the public service expenditures show a tendency to rise disproportionately with the population,

where they incline to keep pace with the population, and whether the functional cost decreases relatively with increasing population or with increasing aggregate service.

Incidentally, however, important as it may be to ascertain what relationship exists between population (the mere number of people in a given political division) and public expenditures, the pitfalls of per capita statistics,—in which popular writers and the reading public bent on proving something seem peculiarly to delight,—must not be lost sight of. "Figures," says Webb in his recent revision of Mulhall's Dictionary of Statistics, "according to the oft-quoted dictum, can prove anything. As a matter of fact, they prove nothing. It is the human mind that proves (or attempts to prove) things, and figures are but evidence to be examined, weighed, and judged, as is any other kind of evidence." I believe I risk nothing in saying that there is no branch of statistical inquiry to which this statement is more applicable and with respect to which its implied warning should be more closely followed than in the new but rapidly developing science of municipal financial statistics.

There are numerous factors of importance besides population which cannot be ignored in any comprehensive attempt to interpret scientifically the meaning of the data of financial transactions. The most obvious of these are valuations and area, but there are others of hardly less consequence which immediately present themselves and compel consideration the moment we enter upon any of the grand divisions of municipal service. For example, considerations of topography and the character of building construction are quite as vital elements in undertaking to determine needful expenditures for the protection of property from fire as is the mere number of people living upon the area to be protected, and in some instances even more so; and a per capita comparison of the cost of maintaining the fire protection service of two cities of approximately the same size, one of which is situated upon bluffs or hilly territory requiring a greater expenditure for apparatus than its sister city spread out over a plain, might be quite meaningless, while certainly the cost of protection should be less in factory cities where the construction is

of some material more nearly fireproof than wood. Obviously, also, proper expenditures for the public schools, can be determined neither by the aggregate population nor by the area of the city, nor by the ability alone of the taxpayers to provide training in other than rudimentary branches,—but must rest primarily upon the number of children to be educated, and, secondly, upon density of population, that is, the distance which pupils must travel to school, since the larger the area upon which any considerable number of pupils live under one system, the greater the number of schoolhouses which may legitimately be maintained. Such illustrations might be extended through the whole list of municipal functions.

But I confess to a certain degree of apprehension at this time lest the importance in this work of establishing and maintaining the statistical viewpoint, with its prophetic possibilities, be minimized or submerged by the more immediate and pressing requirements of the situation on the side of auditing and accounting. The necessity of municipal accounting reform has been, and still is, so urgent, the conditions which are stimulating it are so apparent, and the organizations and individuals which are now fighting for it all over the country are so influential that the current drift in legislation on the subject in some of our states, of which Ohio and Indiana may be cited as the leading examples, appears to be in the direction of a strong centralized supervision over municipal accounting methods by means of a periodical state audit of all local financial transactions, with the making of returns to be compiled as the basis of comparative statistics a secondary consideration. Indeed, it is entirely natural, where the state has set out openly and without disguise to assume direct control and supervision over the financial management of its local political subdivisions and has placed this work in charge of a department created ostensibly for accounting and auditing purposes, that its latent possibilities for greater ultimate usefulness by means of comprehensive and carefully compiled statistical information should, even if appreciated, be but imperfectly developed.

The other point of view, *i. e.*, that which recognizes the

importance, as a direct means of measuring efficiency, of reducing the data of municipal finances to an intelligible basis by the statistical processes of revision, classification, and verification,—with actual supervision of financial methods as a secondary and incidental consideration,—is perhaps best typified in the legislation of Massachusetts and Wisconsin on this subject. In Massachusetts we are still very strongly influenced by traditions of local self-government which have grown up through generations of attachment to the town meeting, and anything which savors of ostensible state supervision over local affairs is likely to be viewed with considerable jealousy, perhaps more so than in the newer communities of the region beyond the Alleghenies where the traditions of the oldest states date back as yet scarcely a hundred years. In this ancient commonwealth every fresh proposition for the assumption by the state of any form of jurisdiction over local affairs has to fight its way and seldom becomes established in our statutes without being obliged to submit to the test of necessity,—of being justified only as a last resort.

Massachusetts, therefore, acted distinctly upon this theory of local responsibility when it undertook to work out a program of accounting reform for its cities and towns, and, instead of meeting the question in the manner which was theoretically most logical, namely, by providing for the general installation of a uniform system of municipal accounting throughout the commonwealth, with incidental returns for statistical purposes to a central bureau upon a schedule based upon the accounting system, the legislature at first (in 1906) simply provided for returns to be made by local accounting officers to the recognized statistical department of the Commonwealth upon forms to be supplied for the purpose. Subsequently (in 1910) cities and towns were authorized to petition the director of the Bureau of Statistics for an audit of their accounts and the installation of an accounting system, the cost to be assessed back in the next state tax, so that although the authority of the department has been increased it may still be exercised in this particular only as the result of local initiative.

The Massachusetts policy was based upon the theory that

any needed changes in accounting methods would, in the long run, prove more effective if our municipalities could first be brought to appreciate their importance and be induced to make them in a measure voluntarily, with the supervisory assistance of the state, than might be the case if such changes in methods were forced prematurely upon municipalities unwilling or unable to comprehend the need of reform. The legislature may at some time, perhaps, deem it desirable or necessary to alter this policy, but at present it is operating most satisfactorily and is producing results of a more substantial and lasting character than would, I believe, have been likely under mandatory legislation. The Wisconsin law is framed on practically the same underlying principle and is being administered, I believe, in the same spirit, and with the definite purpose in view of gathering and disseminating for the immediate benefit of the local communities and for the information of students of municipal government, carefully compiled and reliable statistical data.

Surely there must be some lessons which can be drawn from the enormous waste and inefficiency, amounting in so many instances almost to failure, which have marked the administration of public, and especially of municipal, affairs in our country. There must be some intelligent basis on which the contributions of society for the common welfare may be expended for the accomplishment of the largest results with a minimum of waste and a maximum of efficiency in the process. It ought to be possible to determine what causes may be logically and properly responsible for increasing expenditures, and wherein increasing revenues may be directed into new channels of legitimate endeavor. And, both in the interest of the truth of science and of entire fairness to administrative officers, it is of fundamental importance in the interpretation of statistics of municipal finances that the line of discrimination should be carefully drawn between the natural, economic, or physical reasons which may furnish a legitimate basis for expenditures and the wholly unnatural and uneconomic practices which make for wasteful expenditure.

While the people in our cities and towns ought not to be permitted to delude themselves with the idea that any con-

siderable measure of responsibility for efficiency in local administration can safely be transferred to any higher authority, it is at the same time plainly apparent by all the signs of the times that they do not propose to be governed much longer by the spirit of *laissez faire* in their municipal affairs. In this situation the true and ultimate function of the state, it seems to me, is to protect the taxpayers of the future by placing proper restrictions upon the incurrence of debt by the present generation and, in the interest of common honesty, by making due provision for its payment; to assist in the establishment of adequate accounting systems in the separate communities; and to take what otherwise are mere bookkeeper's figures and by observation, classification, correlation, and analysis develop certain definite laws of public expenditure,—in a word, to galvanize these figures into living object lessons that shall make for a better and broader civic life.

UNIT ACCOUNTING IN SOCIAL WORK.*

By Robert A. Woods, *Head of South End House, Boston, Mass.*

The increasing determination with which community problems are being grasped leads social workers to inquire what can be done to give to their efforts that penetrating, protean, assured, exhaustive character which goes with the best developments of modern scientific organization. They feel, in connection with practically all of their problems, the necessity of much more complete and detailed objective information. While they would strongly sustain the tendency toward broad inquiries leading to more intelligent social legislation, state and national, they are today rather more concerned about that close-range blending and shading of social fact which points the way to effective social administration.

It is more and more clearly understood that the local neighborhood is the true unit of constructive social effort. In many of our cities the whole variety of social service, whether under public or private auspices, is beginning to be coördinated within each of a number of larger districts. These districts are then, of course, in practice analyzed into many fractional areas according to differences of condition which obtain.

This development, in a wholly practical way, is creating a constantly stronger demand for ordered information as to the cumulation and congestion of human facts and tendencies in these rather minute sub-sections, as the essential preliminary to the development of a strategy which will be able to bring to bear the various kinds, grades, and degrees of social resource to bear upon each precise localized plexus of conditions.

The social worker thus begins to look enviously at the very large and exceedingly varied stores of local information which is packed away, unclassified and unavailable, in the storerooms of a long list of public offices, national, state, and city. Their suggestion refers not only to the national census and to

* Paper read at the annual meeting of the American Statistical Association, Boston, Mass., December 28, 1912.

state censuses, but to every public department of whatever sort which makes a practice of registering comprehensive information about any specialized phase of the life of the community.

It is understood of course that the tabulation by small local areas of all this information would involve a substantial addition to the expenses of all these departments. No doubt the social workers are ill-informed as to the amount of additional work which would be entailed. It is true, however, that such tabulation kept within practical limits could not in any case cost more than a fraction of the original expense of collecting the material; and it is hardly open to question that, in due time, such an additional investment would increase the returns to the community on its statistical investments far out of proportion to its amount.

It is desired that the national census shall give for such small areas the following information: total population by age and sex; number of families; nationality, with length of time in the United States; occupation. It is felt that if the state conducts a census, there should be schedules and local tabulation for the following: parent nativity; tenements, apartments, and lodgings; room density; rents. It is understood that the national census of 1910 will include the tabulation of certain population statistics by areas averaging forty acres for seven of the largest cities.

A relatively much smaller expense, with very great results in public and private community service, would come from the localization of statistics gathered by the various forms of public registration, whether by city or state. The general registration of marriages, births, diseases, and deaths should by all means provide a minutely detailed exposition of these facts, in terms of social geography and classified by age, sex, and nationality, so that the responsible local citizen could trace the currents of life which are so vitally affecting his home and neighborhood. The moral statistics involved in the facts about arrests and convictions for various offences should be, and easily could be, set over against and charged up to the precise local environment which has so much to do with breeding vice and crime. The same principle should be applied to

the records of all institutions for the care of disease and degeneracy, so that specific, identical, provoking causes might be studied and infallibly aimed at by the agencies of localized social service.

The International Congress of Hygiene and Demography held in Brussels in 1903 reported that "the only means for the government to acquire precise knowledge of the danger of alcohol and the necessity for energetic measures against it is to organize a great statistical referendum by which the losses due to alcohol should be carefully analyzed." This "great statistical referendum" is what is needed for all the forms of social degeneracy; and the careful analysis of losses must include the itemized charging up of losses to every small neighborhood, and the tracing of those losses back to causes which will be disclosed by similarly itemized statistics as to the whole range of local social conditions.

It is easy to appreciate the gains that would be made in the more effectual segregation of the unfit, and particularly in dealing with the human and institutional causes of degeneracy, by analytical methods of which modern surgery and modern commercial organization would not be ashamed. As a single instance of how a system of social accounting might be put into effect, the police commissioner of Boston recently conducted an experiment designed to trace cases of drunkenness back to the specific saloons in which the oversupply of liquor was sold. Through inquiries made of each arrested drunkard, he secured damaging information with regard to a large number of saloons, and an overlapping testimony in certain cases which clearly marked out a group of licensees for discipline.

In some cities a complete list of registered polls is made up annually, including all male inhabitants over the age of twenty, their present addresses, their addresses the year before, and their occupations. Some settlement houses have used this list as a very serviceable basis for making up maps showing, by blocks, nationality (through the names) and occupation. A competent handling of this list for the city as a whole would yield substantial suggestion and guidance to the social worker.

The public school administration in many cities conducts an annual census; and as better medical supervision is provided

the authorities come to have in their possession vitally important information as to the number and distribution of undernourished and backward children. So far, instead of being set forth in its localized bearing and expressiveness, this information is jealously guarded from the most responsible social worker.

For certain registered facts it would not be too much to ask that the information should be minute to the point of specifying individual houses,—as in the case of arrests and certain diseases, real estate transfers, and changes in assessment. The development of this general method would naturally lead to easy access on the part of properly responsible persons to the last details in the possession of the authorities.

One of the most important results of such a policy in applied statistics would be the better proportioned and adjusted service of the city departments,—sanitary, police, educational,—and the more effective distribution of new municipal agencies, such as baths, gymnasiums, playgrounds, and centers for evening recreation and assembly. Progressive philanthropic service would at once find its path greatly cleared and illumined, in such fields as,—the systematic care of infant vitality; the coöperation with the public schools, in matters of child health, child morals, and vocational guidance; inspection and regulation of housing; industrial accidents and diseases; local follow-up work after the various forms of institutional care; the movement of population and of industry into and out of local districts; the whole system of preventive and constructive social service, including recreation, education, and religion, as followed today to the doorsteps and firesides of the people.

The full effectiveness of this method will be experienced as, within the given small local unit, one set of facts can be superimposed on another, until the full resultant of conditions is made evident,—almost as if the finger of fate were to indicate the status and destiny of that particular spot; and these resultants can be effectively compared from year to year and from decade to decade so as to register unmistakable indications for social statesmanship. The value of this method in

measuring and testing many forms of public and private service for the improvement of community conditions, is obvious.

Every local office of a charity organization society and every settlement house is today the originating center of a guild of neighborhood workers which would eagerly make use of all such dynamic suggestions. The social service commissions which are increasing so rapidly in many of the great branches of the church are making the local community their unit of attack and are placing great emphasis upon varied and well coördinated knowledge of the situation. In cities and in villages the local improvement society is steadily coming forward as a broadly established and vitally influential agency, bringing into active participation in public affairs the great reserve detachments of our citizenship. In these societies, exact knowledge about recognized, common needs is indispensable not only to specific achievement, but to the building up of local loyalty and public spirit. And when representatives of any or all of these forces go before municipal administrators or state legislators they find them almost pathetically ready to act on the basis of facts which they can put the finger on, and as pathetically weary of reformers who can only say, Lo here, and lo there.

Finally, such exactly pointed information would bring about a much more effective form of coöperation between the different neighborhoods and districts of a city. The kind of interrelated town meeting spirit which made the New England commonwealth,—through exact local knowledge and informed local responsibility,—is coming into force for the organic reconstruction of our cities; and expressive statistics can do much to promote and sustain the revival. City planning is as yet almost literally in the stage of seeing men as trees walking; the right unit of statistical representation will do much to enable it to see clearly what the city means. From this point of view the localization of statistics is valuable not merely from the point of view of local social service, important as that is, but it will in many ways clarify and reënforce the meaning of statistics in their broadest application. In fact, this method is suggestive in certain respects of the passage in medical science from the study of symptoms to microscopic bacteriology.

Some years ago a special inquiry into infant mortality in Boston, which went farther than the regular system for reporting such data by wards, disclosed the fact that there was one ward which had four times as great infant mortality on one side as it had on the other. The usual method, as a means of truthful representation, suggests the grotesque paintings of the Parisian cubists, who undertake to represent every object in the landscape, including the human figure, by structures made up of sizable parallelograms in flat tones. And yet some of the most exquisite engravings are put together on this same principle,—the reason for their illuminating, stirring expressiveness is that the squares which are their unit of expression are minute and subtly differentiated.

SOME POSSIBILITIES IN THE PRACTICAL APPLICATION OF FEDERAL CENSUS RESULTS.*

By William S. Rossiter.

Legislation to comply with the provision of the Constitution requiring enumeration of all the inhabitants of the United States, was one of the subjects which early claimed the attention of the First Congress. A few of the more thoughtful members of that historic body dimly perceived in the proposed census certain limited possibilities of usefulness to the government in addition to securing the basis of apportionment of representatives in Congress. The arguments of this small group prevailed with their associates to the extent of securing a provision in the law requiring that a few simple facts be obtained, instead merely of a count of inhabitants, and thus the American Census was started upon its career of growth and of usefulness in connection with innumerable public and private problems.

At the period of the First Census the opportunity for a variety of striking census facts and hence for usefulness to the statesman and the student unquestionably was much less than it is today. A century and a third ago probably no one of the civilized nations possessed a more homogenous population than did the young republic in North America. The white population of the United States at the time of the first census appears to have been composed of considerably more than 95 per cent. of British stock. Hence, at the earlier censuses, the subjects of nativity and parentage which are of such importance today, in a comparative sense, were scarcely worth considering. Moreover, manufacturing was accomplished by farm households; there was no transportation; wage-earners were almost wholly males; and furthermore about 90 per cent. of the population was engaged in, or dependent on, some form of agriculture. Consequently the interesting and complicated subjects of gainful occupa-

* Paper presented at the annual meeting of the American Statistical Association, Boston, Mass., December 30, 1912.

tions for both sexes, of seasonal trades, and the statistics of industrial operations were equally unknown.

In examining the reports of successive federal censuses, the student is especially impressed by the growth from decade to decade in the amount of information presented upon basic subjects such as population and occupations, and by the expansion of inquiries. It is clear that there must have existed an increasing demand for information, resulting doubtless from the rapid growth of the nation. Expansion in the amount and variety of federal census data did not result from mere curiosity or scientific progress. A constantly wider desire to turn the figures obtained to some practical use was a factor of importance.

We shall all agree that at the present time, in composition of the population, in place of residence, and in occupation, the American people are in a state of flux, yet in population change and in occupation must lie ultimately the answer to the question so frequently asked concerning the permanence of the republic. But as these subjects become more complicated they become more difficult to comprehend and more serious. There are, indeed, many problems arising from time to time in connection with both subjects, upon which a well-equipped and effectively conducted federal census bureau, by reference to the wealth of census material, could throw much light by means of frequent special studies which might be, and indeed ought to be, of direct practical value to states and local communities.

The writer's ideal for the federal Census Bureau has long been to see it become an effective laboratory of experiment having somewhat the same relationship to the population of the United States as that borne by some of the bureaus of the agricultural department to the welfare of plants and animals. A somewhat intimate connection with the federal Census Office and especially with its publications, for a period of ten or a dozen years during and following the Twelfth Census, developed the conviction that a proper distribution of the labor of conducting the routine affairs of the bureau and of preparing and issuing special, helpful studies had not been reached. This defect was so clearly recognized

that certain changes of policy were under serious consideration by the then Director of the Census to greatly broaden the practical value of census results. The period was, and still is, peculiarly appropriate for special research and interpretation. The remarkable increase in population of foreign birth drawn from races which hitherto have borne little share in the upbuilding of the nation and representing extreme departures in racial types, the eddying tides of humanity which before had always formed one great general current westward, and the increasing complexity of industrial operations resulting in striking and perhaps unexplained changes invited special studies likely to be profitable for individual states.

After retiring from the federal service following the change which occurred in the administration of the Bureau in 1909, the writer determined to test in a limited way the value of the plan for special studies by an experiment to be made as soon as the results of the enumeration at the Thirteenth Census were announced. He had long been interested in the population conditions in Vermont. He believed, in the light of previous census returns, that this state was in need of an orderly analysis of the changes which had been long in progress. Accordingly, in the intervals of many activities, he prepared an analysis of population conditions in the state from tables very courteously prepared by the Director of the Census. This study which was published somewhat more than a year ago in the Quarterly Publications* of this Association, may be recalled by some of those present. The immediate effect of this review of conditions in Vermont, which necessarily carried with it some elements of discouragement and revealed conditions in some respects rather grave, was to excite criticism. Doubtless this resulted largely from the fact that the paper was a private production, as contrasted with a government report, and had the Vermont analysis been part of a public series it is unlikely that any prejudice whatever would have appeared. The ultimate result, however, even of this private study, which as a matter of fact was undertaken for the purpose of performing a service, has

* Vol. XII, No. 93.

been to arouse many thoughtful citizens of the state to conditions which it is still within their power to remedy, and to lead to considerable agitation and discussion, the results of which cannot fail to be beneficial.

In the opinion of the writer, upon the theory that the Census Bureau is a laboratory or experiment station maintained to furnish the greatest possible assistance, it should be the duty of the Bureau, upon the appearance of figures in connection with any inquiry, which reveal an unfortunate condition or one that is likely to prove unfavorable in connection with race, population, or occupations in any state, to at once dispatch experts to the field in exactly the same fashion that the Secretary of Agriculture sends to the South experts to discuss cotton pests, or to the North or the West others to deal with the diseases of cattle, grain or fruits. The Bureau having accumulated sufficient data should then promptly prepare a careful and sympathetic review of the subject, in which the human element shall not be entirely lost. This should include discussion of the causes which have produced the unfavorable conditions and should if possible point to remedies sufficiently practical to commend themselves to the people of the states or communities involved.

I have already referred to the monograph upon Vermont published by this association and prepared by private citizens without suitable resources or time for the task. There is nothing at present affecting the population of Vermont which cannot be overcome by intelligent effort, but the Census Bureau could have been, and could now be of incalculable service to the people of the state in their effort to better conditions, if, upon detecting seemingly unfavorable population signs, it had been organized to promptly prepare and publish a brief monograph reviewing the changes of population which have occurrred and pointing out the directions in which they tended. It should be noted, also, that the census of manufactures in 1910 revealed the fact that Vermont showed the smallest increase in value of products of any state in the Union. Obviously a chapter on the causes of this change and some reference to favorable tendencies would be helpful. The modern census has now reached such

colossal expense that the States are entitled to the greatest possible dividend in helpfulness.

At the census of 1910 the changing conditions of population in the state of Missouri by which more than half of the counties in that populous state decreased sharply in number of inhabitants excited considerable interest among statisticians. It has been said in explanation that this condition was the result of wholesale emigration from Missouri to the new state of Oklahoma, just as in 1900 a similar decrease in Iowa was caused by the removal of many thousands of people across the Canadian border to the rich wheat fields of the Northwest. The mere explanation concerning the destination of great numbers of substantial citizens is of comparatively little value, but the fact that they have *gone*, is all important to Missouri. The federal government might properly prepare for states, affected by acute diseases of this kind, studies which reveal clearly the growth of the counties affected, the exact facts concerning the population change, and the remedies, if any, which should be applied. It is possible that the state of Missouri is so rich in citizenship that it can withstand the drain upon population resources for one decade, or longer, but Vermont and some of the other eastern states have shown conclusively that this cannot continue for a long period without a decided decrease in the quality of citizenship and in the prosperity of the state. If great numbers of the citizens of Missouri remove from the state, it is reasonable to believe that there are conditions of existence in many counties, at least, which have produced discontent and which perhaps earnest and intelligent action could remove. What are these conditions?

Nothing is more marked among the facts developed from the population returns of the Thirteenth Census,—so far as we know what they are,—than the changing conditions of residence in the country and city, and the equally striking change in composition of the population, especially of the cities. Curiously enough one race tends to succeed another in a locality, calling, or operation. Such developments as the Lawrence strike might merit attention in its broadest general population aspects.

There might also be profitably made certain special studies upon the proportion of children in states where marked decrease has been noted. It was remarked by the Superintendent of the Ninth Census in the report on population in 1870 that the birth rate in the United States had been steadily decreasing since the earliest census returns. The fact which had impressed this official 40 years ago has become steadily more acute, and while we lack entirely certain data upon which to base any definite conclusions as to birth rate very far back in time, a study of the proportions formed by young children to the remainder of the population at different censuses, which indeed can be made from the very beginning of census taking, would prove exceedingly interesting, and might be of much value. The solicitude in France over the decreasing birth rate and the futility of measures which there have been taken to arrest it, suggest that if such a malady exists in this country, concealed and minimized by generous immigration, it is likely to prove the gravest of national diseases. Studies upon this subject by the federal Census Bureau, if made carefully and conservatively, cannot fail to be of value. Many of us, indeed, believe them to be imperative.

In the returns of the census of agriculture published by the Bureau, it is not customary to go below the county unit in any of the details. Taking again the case of Vermont, in value of agricultural products during the past decade a large increase appears, due principally to a form of inflation resulting from the general rise in the cost of living. Vermont and other states are being mislead by such figures. It would be of immense advantage to all the states if they could have comparative figures for the amount and value of farm products for certain towns, at least in some counties. Such studies for small areas which showed doubtful results at the Thirteenth Census, would be exceedingly valuable in all the New England states, in New York state, and wherever the problem of agricultural production is growing more serious.

Another subject of great future importance to some eastern states is the value of the summer estate in comparison with the retention of the land in farms. So far as I am aware this subject has never been discussed. Already a number

of townships in several New England states have been so completely bought up by summer residents that they have been practically withdrawn from agricultural production. Are there sufficient compensating advantages? Such facts as are available seem to make it very doubtful. The Census Bureau has all the necessary data for 40 years at least to illuminate this subject, which is constantly becoming of greater interest.

The Thirteenth Census has developed an interesting fact in connection with the broad subject of the industrial growth of groups of states, which is worthy of serious attention in the form of a special study. The development of industrial states at the North, comprising New England, New York, Pennsylvania, and New Jersey, by which manufacturing became more and more important and agriculture of less and less consequence and by which the native stock which had peopled and made these commonwealths powerful continually drifted from country to city or to other localities, while the cities grew in wealth and population recruited from all parts of the world, has created new and remarkable population, industrial, and economic conditions in those areas. With little final or definite knowledge as yet on this important subject, most of us probably will agree that the development of a nation or a state along lines almost exclusively industrial and with little regard to prosperity in agriculture is likely to be attended by many serious drawbacks to permanent prosperity. This, however, has been the character of the development, to a remarkable degree, of the northeastern manufacturing states. It now appears that the latest comers in the field of industrial activity, as shown by the Thirteenth Census, is the group of southern states beginning with Delaware and passing south and southwest to and including Oklahoma. This is the area of the United States which has been historically and distinctly the agricultural section of the Union. It has resisted the incoming tide of immigration and in consequence the southern white population has maintained purity of stock with little change except in the larger cities. Within the past dozen years however, there has been a remarkable awakening of industrial devel-

opment, but a study of the returns of the Thirteenth Census thus far published suggests that the southern and southwestern states, whether through design or accident, appear to be following a different policy of industrial expansion from that pursued by the states in which similar growth set in at an earlier period. The southern states have achieved a remarkable advance in manufacturing during the past decade, attended at the same time by great prosperity in agriculture, by the retention in the rural life of these states of a larger proportion of the population than is found in the rural element elsewhere in the nation, and by maintaining comparative purity of the white population. These rather remarkable results seem to be exceptional. Indeed, the percentage of increase in the rural population in this group was approximately double the increase which occurred elsewhere in the nation. About one half of the total rural population of the United States now resides in this group of southern states. The foreign white population, which was approximately 565,000 in 1900, increased about 140,000 during the decade to 1910, but the generous percentage of increase indicated in this result was in reality confined to three of the 16 states in which Texas was the leader, and the proportion formed by the foreign element was approximately but 2.5 per cent. of the entire population.

Judged by the standards established in the development of the industrial states of the North, the tendency to remain upon the plantation and the failure to generously increase the foreign element of the population would not be conducive to industrial activity, but the record of the southern states in this respect during the past decade is both interesting and impressive. Between 1904 and 1909, 52,311 manufacturing establishments came into existence in the United States. One third of this number were located in the southern group. The increase in these states reached almost 50 per cent. as compared with slightly more than 20 per cent. reported elsewhere. Capital invested, wages, and average number of wage-earners in the southern group showed slightly larger percentages of increase than occurred in the other states as a whole. Moreover, the value of the southern manufactured

products, a total of one billion dollars in 1904, advanced to more than two and a half billions five years later. This rate also exceeded the national rate of increase. Thus a group of states commonly regarded as distinctly agricultural apparently has manifested a real industrial awakening.

While this change was in progress, however, the farms in the South increased generously in number as compared with a stationary or decreasing number in all the northern or western states except the far West. The increase in the improved lands in the South outstripped that reported in the North and the Middle West. The southern states reported a little more than 100 per cent. increase in the value of farm property, also greater than that shown elsewhere. Twenty-two states only showed increase in the number of head of cattle from 1899 to 1909, but ten of these were in the southern group. The number of swine in the South showed a stationary condition as against a decrease of 11 per cent. elsewhere. In consequence the rising value of hogs, amounting to more than $3 per head, which attended the heavy national decrease in number, naturally benefited the states in which there had been practically no decrease. Therefore the value of swine in the South approximately doubled during the decade. While in New England the number of sheep decreased 50 per cent. in ten years, and the decrease in all the states of the Union exclusive of the South amounted to 20 per cent. in the latter group it was but 5 per cent. and as the average value of sheep increased $1.67 per head in consequence of the great decrease in the nation, in the southern states where the flocks of sheep remained practically unchanged, the increase in value was substantially clear gain. In short, while the general decline in the number of farm animals from 1899 to 1909 is one of the most interesting and serious facts reported by the agricultural census, the South by holding her own has profited enormously at the expense of the remainder of the Union.

Development in the southern states of late appears to have been two-fold. Industrial activity has grown side by side with increased agricultural enterprise. Apparently there does not exist in the southern states that marked tendency to

abandon the farm and remove to urban centers which has been made so manifest elsewhere. Furthermore the industrial and agricultural development are being accomplished by the native stock and with little evidence of a tendency to increase the foreign element. These interesting facts suggest the possibility of an important study by the Bureau of the Census, analyzing the population and economic development of states and communities with especial reference to healthful and normal, or over-rapid and one-sided growth.

These are merely some of the many lines of analysis and special research which occur to one worker in census figures as likely to repay in practical helpfulness varying degrees of investigation.

There are many statisticians and economists in this country who have not proved particularly successful when set to work by the Census Bureau as special agents to conduct or analyze entire inquiries, but who are peculiarly qualified to write brilliant and far-sighted discussions of phases of development revealed by special studies of census figures. The highest efficiency of the Bureau cannot be reached, in the opinion of the writer, until side by side with or closely following the publication of basic facts shall appear studies which deal with pressing and often current problems touched by the work of the enumerator, but which generally are permitted to remain buried in census tables, because private investigators do not possess the facilities, or public officials do not possess the ability, energy, or inclination to prepare effective and useful monographs on these practical themes.

This, it must be remembered, is an age of expert investigation in almost all lines of human activity. Capitalists, considering the acquisition of mineral or timber lands or other classes of property, dispatch trusted and experienced investigators to prepare elaborate reports after painstaking inquiry. We deal with the problems of business and life today with greater precision than of old. We seek for exact facts upon which to base judgment and in this the census has been a mighty educating force for the American people. As a nation we have grown to like figures; we have become accustomed *to want to know.* In supplying much of the

information required by this tendency the Census Bureau should lead.

After the publication of the paper previously referred to upon "Population Conditions in Vermont," the writer was told by a citizen of another state that population conditions in his own commonwealth were even worse than in Vermont, but were concealed by urban growth. He suggested a paper for his own state similar to the one published for Vermont. He was told that under no circumstances would the second task be undertaken, with its attendant labor and strain.

Such studies are rightfully public enterprises, and within just limitations as to quality, quantity, and subject, which an efficient Director of the Census should be able easily to establish, they offer a most appropriate and agreeable field of work for the Bureau.

There remains one important qualification in connection with this review of census work. All that has been said in this paper is of no consequence or interest, if the basic tables are not to be issued promptly, or if it be assumed that the work of the Bureau of the Census consists in the collection of figures and their retention in the bureau until clerks and small officials of varying capacity, energy, and limited point of view shall have worked them over and over, to add finally meaningless comment about self-evident totals or percentages.

In the opinion of the writer, this policy is far removed from the purpose and spirit of the modern census. The basic facts of a census should be published in permanent form at the earliest possible moment. The returns should be available in every library for the examination and study of students, and the Census Bureau having thus performed its main function, will then be free to take up such individual studies as the conditions developed by the census and the period may make advisable. Delay in the publication of basic facts for years after the taking of the census is not only fatal to special investigations and most unwise as a policy, but means untold inconvenience to every worker in federal figures. After many years of close identification with the publications of the census, a number of which indeed I have myself written, I am convinced that interpretation of tables

in the regular census reports and bulletins receives from readers (if any) and students practically no attention whatever, and that the only way in which a thoroughly effective presentation can be made is a special paper or monograph which forms a well-rounded, logical, and continuous discussion embracing all important phases of a given subject.

As suggested at the outset, there has been no period in the history of the United States in which discussion of the various tendencies of our composite population, of our changing industrial and agricultural life, and of the sinister tendencies toward decreasing fertility has been more urgently needed than it is at present nor one in which it could accomplish more good for individual localities and states. It may be fairly claimed that the opportunity for the Director of the Census to benefit his fellow citizens is greater than the opportunity of almost any other federal official, since while others deal with commercial conditions, with the qualities and breeds of cattle, with tariffs and with the products of the mines, he alone has it in his power to show the change—the improvement or retrogression of the human stock which comprises the nation.

SOME RECENT CHANGES IN THE COMPOSITION OF THE POPULATION OF THE UNITED STATES.*

By William B. Bailey, *Assistant Professor of Economics, Yale University.*

This article deals with recent changes in the composition of the population of the United States and is restricted to the three subjects of Sex, Age, and Marital Condition. For the permission to use the unpublished material for the Census of 1910 I am indebted to the Director of the Census, who courteously placed at my disposal all available statistics upon these subjects.

Sex.

TABLE I.

SEX DISTRIBUTION OF THE POPULATION OF CONTINENTAL UNITED STATES, 1820–1910.

Census.	Population.				
	Total.	Male.	Female.	Excess of males.	Males to 100 females
1910	91,972,266	47,332,090	44,640,176	2,691,914	106.0
1900	75,994,575	38,816,448	37,178,127	1,638,321	104.4
1890 (a)	62,947,714	(b)32,237,101	(b)30,710,613	(b)1,526,488	(b)105.0
1890 (c)	62,622,250	32,067,880	30,554,370	1,513,510	105.0
1880	50,155,783	25,518,820	24,636,963	881,857	103.6
1870	38,558,371	19,493,565	19,064,806	428,759	102.2
1860	31,443,321	16,085,204	15,358,117	727,087	104.7
1850	23,191,876	11,837,660	11,354,216	483,444	104.3
1840	17,069,453	8,688,532	8,380,921	307,611	103.7
1830	12,866,020	6,532,489	6,333,531	198,958	103.1
1820	9,638,453	4,896,605	4,741,848	154,757	103.3

(a) Includes population of Indian Territory and Indian reservations.
(b) Sex estimated for white and negro in Indian Territory.
(c) Excludes population of Indian Territory and Indian reservations.

Table I shows the total population, number of males and females, excess of males, and proportion of males to females at each census of the United States from 1820 to 1910. Since no attempt was made to ascertain the sex of the negro population at the first three censuses, a sex table for the total population must begin with the Census of 1820. The excess of males in the population of Continental United States

* Paper read at the annual meeting of the American Statistical Association, Boston, Mass., December 30, 1912.

amounted to 2,691,914 in 1910. This excess was over a million greater than that shown at any previous census. From 1820 to 1910 the excess of males has increased with each succeeding census with the single exception of 1870. Decrease in the excess of males during the decade 1860–70 must be attributed to the loss of life among the males occasioned by the Civil War and to the small immigration during that period.

The sex composition of the population is shown more clearly by the proportion of males to females than by the absolute numbers. In 1910 there were 106.0 males to 100 females in the total population of Continental United States. This is the highest figure recorded at any census. From 1820 to 1830 there was a very slight decrease in the proportion of males. From 1830 to 1860 there was a gradual increase. During the decade 1860–70 the decrease was very marked and at 102.2 touched the lowest point yet recorded. From 1870 to 1910 there has been a continuous increase in the proportion of males, with the exception of the decade ending in 1900.

The influence of the Civil War in decreasing the proportion of males between 1860 and 1870 has been noted, but aside from this the preponderating cause in the determination of the sex ratio seems to have been immigration. When the stream of arrivals to this country dwindled the proportion of males in the total population decreased; when the stream rose in volume the proportion of males increased. In 1819 an act was passed requiring that "The captain of any ship" arriving in the United States from any foreign place "shall designate, particularly, the age, sex, . . . of said passengers." The statistics of sex were not all recorded until 1869, but are sufficiently complete to furnish a basis for comparison.

TABLE II.

IMMIGRATION TO THE UNITED STATES BY SEX FOR TEN YEAR PERIODS ENDING JUNE 30, 1820–1910.*

Period.	Immigrants.				Immigrants to 100 mean population.†	Number of male to 100 female immigrants.
	Total.	Male.	Female.	Sex not reported.		
1820–1829	119,052	74,100	31,963	12,899	1.0	232.1
1830–1839	463,213	286,663	156,858	19,692	3.1	182.7
1840–1849	1,389,301	816,631	564,371	8,299	6.9	144.7
1850–1859	2,816,055	1,641,586	1,168,461	6,008	8.7	140.5
1860–1869	2,115,880	1,093,083	713,391	309,406	6.0	153.2
1870–1879	2,742,137	1,673,008	1,068,990	.....	6.2	156.5
1880–1889	5,248,568	3,211,646	2,036,849	.....	9.3	157.6
1890–1899	3,694,294	2,275,035	1,419,259	.....	5.3	160.3
1900–1909	8,202,388	5,710,052	2,492,336	.....	9.8	229.1

During the decade 1820–29 the immigration was very small, amounting to but 1.0 per cent. of the mean population during this period. At the same time the proportion of males in the total population decreased slightly. From 1830 to 1859 we find a steady increase in the comparative immigration, accompanied by an increase in the proportion of males in the total population. During the decade 1860–69 both significant figures decrease. From 1870–89 the increase in immigration is reflected in an increase in the proportion of males in the total population. During the decade 1890–99 both the immigration and the sex ratio decrease. From 1900–09 we have the largest proportional immigration ever recorded, and at the same time the ratio of males to 100 females among the immigrants rises to 229.1. A considerable increase in the proportion of males to females in the total population might be expected to result from this conjuncture. This proves to be the case and the increase in the sex ratio is more rapid than during any other decennial period in the table. The high correlation between these two sets of figures would seeem to imply that immigrat ion had been the principal determining factor in the sex ratio in this country.

* Data compiled from official sources: 1820–1867 for "alien passengers arriving"; 1868–1903 for "immigrants arriving"; 1904–1905 for "aliens admitted"; 1906–1910 for "immigrant aliens admitted."

† In this table the mean population at each period is assumed to be one half the sum of the figures determined by the census at the beginning and end of the period. If another column were added to the table consisting of the product for each period of the two preceding columns, these arbitrary values might give a satisfactory measure of the influence of immigration upon the sex ratio of the total population.

TABLE III.

SEX RATIO OF THE POPULATION OF CONTINENTAL UNITED STATES FOR GEOGRAPHIC DIVISIONS, 1890-1910.

Division.	Males to 100 females.		
	1910.	1900.	1890.*
Continental United States	106.0	104.4	105.0
New England	99.3	97.7	96.9
Middle Atlantic	103.3	100.9	100.4
East North Central	106.0	104.7	105.4
West North Central	109.9	109.7	111.2
South Atlantic	101.2	100.0	99.5
East South Central	101.9	101.9	101.7
West South Central	107.2	106.7	107.6
Mountain	127.9	128.0	141.7
Pacific	129.5	128.2	142.0

In 1890 there was an excess of females in both New England and the South Atlantic divisions, but in 1900 and 1910 New England was the only division to show such an excess and in 1910 this had all but disappeared.

The most noticeable feature in connection with the sex distribution of the population of the several divisions is that the proportion of males increases from East to West. Thus no division to the east of the Mississippi River has over 106.0 males to 100 females, while to the west of this river every division has a proportion of males higher than this figure, and in the Mountain and Pacific divisions it reaches 127.9 and 129.5, respectively. Internal migration has been responsible for most of these differences since the sections in which the extractive industries predominate attract more males than females. But immigration has also had some influence upon the differences in sex ratio by geographic divisions. There are five divisions in which the proportion of males in 1910 was at least 1 per cent. higher than in 1900. In each of these divisions the per cent. of foreign born whites in the total white population in 1910 was larger than in 1900. The other four divisions, in which the proportion of males increased but little or showed a decrease from 1900 to 1910, had a smaller proportion of foreign born whites in 1910 than in 1900.

* Includes population of Indian Territory and Indian reservations.

TABLE IV.

SEX RATIO OF THE POPULATION OF CONTINENTAL UNITED STATES AND OF THE STATES AND TERRITORIES ARRANGED IN ORDER OF DECREASING PROPORTION OF FEMALES, 1890–1910.

Males to 100 Females.

1910.		1900.		1890.	
State or Territory.	Ratio.	State or Territory.	Ratio.	State or Territory.	Ratio.
Continental United States.	106.0	Continental United States	104.4	Continental United States	105.0
District of Columbia	91.3	District of Columbia	90.0	District of Columbia	90.7
Massachusetts	96.7	Massachusetts	95.1	Massachusetts	94.5
South Carolina	98.5	Rhode Island	96.5	Rhode Island	94.7
Maryland	98.9	North Carolina	98.3	North Carolina	97.6
North Carolina	99.2	Maryland	98.4	Maryland	97.9
Rhode Island	99.3	South Carolina	98.4	Connecticut	98.1
Georgia	100.1	New York	98.9	New Hampshire	98.2
New Hampshire	100.9	Georgia	99.1	New York	98.6
Virginia	100.9	New Hampshire	99.6	South Carolina	98.9
Alabama	101.0	Virginia	99.7	Virginia	99.1
New York	101.2	New Jersey	100.0	New Jersey	99.5
Mississippi	101.6	Connecticut	100.0	Louisiana	100.0
Louisiana	101.7	Alabama	100.5	Alabama	100.2
Tennessee	102.1	Louisiana	101.1	Georgia	100.3
Connecticut	102.3	Mississippi	101.5	Maine	101.2
New Jersey	102.9	Tennessee	102.2	Mississippi	101.5
Kentucky	103.0	Maine	102.2	Tennessee	101.8
Maine	103.2	Ohio	102.3	Ohio	102.2
Ohio	104.4	Kentucky	103.1	Kentucky	102.9
Delaware	104.6	Pennsylvania	103.5	Pennsylvania	102.9
Indiana	105.0	Vermont	103.9	Delaware	103.2
Missouri	105.1	Delaware	104.0	Vermont	103.8
Vermont	105.3	Indiana	104.4	Indiana	104.1
Pennsylvania	105.9	Utah	104.9	West Virginia	104.8
Arkansas	106.0	Illinois	105.3	Illinois	106.4
Iowa	106.6	Missouri	105.6	Florida	106.6
Illinois	106.8	Arkansas	106.1	Missouri	107.1
Michigan	107.3	Michigan	106.6	Wisconsin	107.7
Texas	107.4	Wisconsin	106.6	Arkansas	108.0
Wisconsin	107.4	Texas	107.4	Iowa	108.4
Florida	110.0	Iowa	107.6	Michigan	108.9
Kansas	110.0	West Virginia	108.6	Texas	110.3
Nebraska	111.2	Florida	108.7	Kansas	111.4
Utah	111.5	Kansas	109.5	Utah	113.3
West Virginia	111.6	Nebraska	112.5	Minnesota	114.5
Oklahoma	113.7	Minnesota	113.9	New Mexico	116.9
Minnesota	114.6	New Mexico	114.4	Nebraska	117.8
New Mexico	115.3	Oklahoma and Indian Ter.	115.3	Oklahoma and Indian Ter.	118.2
Colorado	116.9	South Dakota	116.6	South Dakota	119.7
South Dakota	118.9	Colorado	120.9	North Dakota	123.8
North Dakota	122.4	California	123.5	Arizona	135.3
California	125.4	North Dakota	125.3	Oregon	137.1
Idaho	132.5	Oregon	129.0	California	137.6
Oregon	133.2	Idaho	136.5	Colorado	146.7
Washington	136.3	Arizona	140.4	Idaho	151.5
Arizona	138.3	Washington	142.2	Washington	163.3
Montana	152.1	Nevada	153.0	Nevada	173.3
Wyoming	168.8	Montana	160.3	Wyoming	180.5
Nevada	179.2	Wyoming	169.4	Montana	187.0

In 1900 it appeared that the differences in the sex proportion of the divisions were growing less, that "the statistical differences between the different parts of the United

States have decreased in ten years."* Thus in 1890 the difference between the sex proportion of New England and the Pacific division was 45.1. In 1900 this was but 30.5. In 1910 it was 30.2. For the time being, at least, the tendency of the extreme divisions to approach equality has been greatly retarded.

In 1910 there were, in addition to the District of Columbia, five states with an excess of females. All of these states are on the Atlantic coast line. In 1890 and 1900 there were ten states besides the District of Columbia in which the females outnumbered the males and all of these states were on the Atlantic seaboard.

It is apparent that Louisiana is the only state west of the Mississippi with less than 105 males to 100 females. In the South Atlantic and East South Central States the large proportion of negroes has made the numbers of the sexes more nearly equal. The New England and North Atlantic States have a large proportion of foreign born. Among this class the males usually form a large majority, but the opportunity for women's labor in these sections has attracted an unusual proportion of female immigrants. These states have also lost a considerable number of males born in them, through migration to more western communities.

Florida and West Virginia have a sex ratio approximating that in the states to the west of the Mississippi. This peculiar condition seems to be very largely the result of the nature of the industries in these two states.

In all but thirteen states the proportion of males increased from 1900 to 1910. Only one of the states to show a decrease in the sex ratio (Tennessee) was east of the Mississippi. The increase in the sex ratio seemed to be most rapid for those states with the smallest proportion of males in 1900.

*Twelfth Census of the United States, 1900, Supplementary Analysis, p. 90.

TABLE V.

CHANGES IN THE SEX RATIO, BY GROUPS OF STATES, 1900-1910.

	States having in 1900 Proportion of Males to 100 Females of				
	Less than 100.	100.0 to 104.9.	105.0 to 109.9.	110.0 to 119.9.	120 and over.
Males in 1900	10,693,858	12,313,271	11,339,224	2,240,785	2,229,310
Females	10,875,598	12,000,244	10,628,979	1,964,180	1,709,126
Males in 1910	13,005,874	14,264,200	13,162,496	3,110,212	3,789,308
Females in 1910	13,003,340	13,723,953	12,273,912	2,726,054	2,912,917
Males to 100 females in 1900	98.3	102.6	106.7	114.1	130.4
Males to 100 females in 1910	100.0	103.9	107.2	114.1	130.1
Increase of sex ratio in 1910 over 1900	1.7	1.3	0.5	0.0	0.3a

a Decrease.

In order to measure the changes in sex ratio for these groups of states during the decade 1900–1910, Table V is introduced. The states are divided into five groups according to the proportion of males to females in 1900. The number of males to 100 females was computed for the same groups of states in 1910. The increase in sex ratio in 1910 over 1900 was found for each one of the five groups. The increase was the largest for that group of states having, in 1900, the smallest proportion of males, and decreased in magnitude as the groups show an increasing ratio of males to females. For that group of states which, in 1900, had over 120 males to 100 females there was an actual decrease in the sex ratio during the decade. This would seem to show that the states are growing somewhat more uniform when measured by the ratio of males to females.

This tendency toward uniformity was noted in 1900. "The states in 1900 show a range of 15.5 per cent. between the highest and lowest, while in 1890 they had a range of 17.6 per cent.; moreover, the mean departure of the per cents. from 50 was 3.3 for 1890 and only 2.7 for 1900; both of these facts show that the changes have been in the direction of establishing a closer approach to equality in the proportion of the sexes and reducing the differences among the states and territories."*

* Twelfth Census of the United States, 1900. Supplementary Analysis, p. 91.

Since the differences were measured from an arbitrary figure, and since no weight was given in the computation to the population of the states, it was decided to use a different method of measuring the deviation from the average. Since the sex ratio for the total population is of the nature of a weighted average the "standard deviation" is probably the best measure of the deviation of the sex ratios of the states from the average. The "standard deviation" (from the average) of the states in 1890 was 10.7; in 1900, 8.0; and in 1910, 8.5. The "interquartile deviation" from the mean was 4.3 in 1890; 3.45 in 1900; and 3.1 in 1910. It is therefore evident that although the deviation from the average was much less in 1900 than in 1890, there had been but a very slight change during the decade ending in 1910.

TABLE VI.

SEX RATIO OF THE POPULATION OF CONTINENTAL UNITED STATES CLASSIFIED BY COLOR, 1850–1910.

Color.	Males to 100 Females.							
	1910.	1900.	1890[a]	1890.[b]	1880.	1870.	1860.	1850.
Total	106.0	104.4	[c]100.0	105.0	103.6	102.2	104.7	104.3
White	106.6	104.9	[c]105.4	105.3	104.0	102.8	105.3	105.2
Negro	98.9	98.6	[c]99.5	99.5	97.8	96.2	99.6	99.1
Black	101.8	.....	.....	.....	.....	97.0	101.0	.....
Mulatto	88.7	.....	.....	.....	.....	90.8	90.0	.....
Indian	103.5	101.5	102.6	108.5	104.8	95.0	119.0	.....
Chinese	1,406.5	1,887.2	2,678.9	2,678.6	2,106.8	1,284.1	1,858.1	.....
Japanese	690.8	2,369.7	687.3	687.3	957.1	587.5	.....	.....
All other	1,893.2	.....	.....	.....	.....	.....	.....	.....

[a] Includes population in Indian Territory and on Indian reservations.
[b] Excludes population in Indian Territory and on Indian reservations.
[c] Sex estimated for white and negro in Indian Territory.

In Table VI is shown from 1850 to 1910 the sex ratio of the population of Continental United States, classified by color and race. Differing from all the other groups in this table the negroes have shown an excess of females at every census from 1859 to 1910. Since the negroes have received but slight additions to their numbers from immigration since 1850, the factors of the natural increase of population must be responsible for this sex ratio. It is not probable that males with a small admixture of negro blood are more likely to be reported as white than are the females under

similar conditions. The figures must be accepted as a true picture of the facts.

A perplexing problem is presented by the sex ratios of the blacks and mulattoes. In 1910 the blacks showed a slight excess of males, while among the mulattoes the females considerably outnumbered the males. With 88.7 males to 100 females the sex ratio among the mulattoes reached the lowest point yet recorded for any group in our census returns. The negroes were also distinguished as blacks and mulattoes in the Censuses of 1860 and 1870, and in both of these cases the proportion of males was much higher among the blacks. It may be that the proportion of male births is higher among the blacks than the mulattoes, but statistics are lacking to either prove or disprove this assumption. It may be that the negro women with an admixture of white blood are anxious to be returned as mulattoes, while the males are more indifferent upon this point. There is, however, a third reason which seems more likely to account for this peculiar sex ratio. Since most of the negroes were returned as blacks, the enumerators were likely to follow this practice for the negroes whom they did not see in person. The negro women at the home were more likely to be seen by the enumerators than were the males who were at work in the field or elsewhere. If this supposition is correct the proportion of males among the mulattoes will be smallest in the productive ages. Fortunately statistics upon this point are available.

TABLE VII.

SEX DISTRIBUTION, BY AGE PERIODS, OF THE MULATTOES OF KNOWN AGES IN CONTINENTAL UNITED STATES, 1910.

Age periods.	Male.	Female.	Males to 100 Females.
Under 15 years	1,350,126	1,488,282	91.4
15 to 44 years	443,748	550,193	80.7
45 years and over	130,463	133,053	98.1

Table VII shows that the number of males and females under 15 years and 45 years and over are more nearly equal, while in the active ages from 15 to 44 years the sex ratio

reaches the remarkably low figure of 80.7. If this is a true picture of actual age distribution it is very peculiar. It may be that some females who were over 45 years of age may have reported themselves as under this age, but it seems more likely that a number of male mulattoes in the active ages have been incorrectly returned as blacks.

Age.

On the subject of Age it is impossible in a short space to give any but the most striking figures.

TABLE VIII.

PERCENTILE DISTRIBUTION BY AGE PERIOD OF THE POPULATION OF CONTINENTAL UNITED STATES DISTRIBUTED BY COLOR, NATIVITY, AND PARENTAGE, 1900–1910.

Age Period.	Total.		Native white.				Foreign-born white.		Negro.	
			Native parentage.		Foreign or mixed parentage.					
	1910.	1900.	1910.	1900.	1910.	1900.	1910.	1900.	1910.	1900.
Under 5 years	11.6	12.1	13.2	13.3	14.2	15.4	0.8	0.5	12.9	13.8
5 to 14 years	20.5	22.3	22.6	24.0	24.1	27.5	4.9	4.5	24.5	26.0
15 to 24 years	19.7	19.6	19.8	19.6	21.5	21.5	15.7	14.5	21.3	22.1
25 to 44 years	29.2	28.0	26.2	25.1	27.6	28.1	44.1	43.2	26.9	23.8
45 to 64 years	14.6	13.7	13.6	13.5	11.2	6.6	25.4	27.7	11.2	10.8
65 years and over	4.3	4.1	4.4	4.2	1.4	0.9	8.9	9.3	3.0	3.0

It is apparent from Table VIII that the proportion of the population in the age groups below 25 years was smaller in 1910 than in 1900 while for the age periods above 25 years the proportion in 1910 was higher. For the native whites of native parentage the proportion at all age periods above 15 years in 1910 was higher than in 1900. For the foreign born white the proportion at all age periods below 45 years was higher in 1910 than in 1900 and above this age the proportion was higher in 1900. This is in marked contrast to the other groups and is probably due to the very large migration of the past decade, the result of which has been to increase the proportion in 1910 in the early and active age groups. For the negroes the proportion at all age periods above 25 years was higher in 1910 than in 1900. Although the figures

for the computation are not yet available, it is probable that the median and average ages of the population in 1910 will be higher than in 1900 and will continue the tendency which was shown from 1880 to 1900. It is also probable that the average age of the foreign born whites will be lower in 1910 than was the case in 1900.

Marital Condition.

As in the table for Age so in the tables for Marital Condition percentages only are given since the absolute numbers would be too cumbersome for convenient printing.

TABLE IX.

PERCENTILE DISTRIBUTION BY MARITAL CONDITION OF THE POPULATION OF CONTINENTAL UNITED STATES CLASSIFIED BY SEX, COLOR, NATIVITY, AND PARENTAGE, 1890–1910.

Class of Population and Sex.	Per cent. of Persons 15 Years of Age or over Who Were								
	Single.			Married, widowed, or divorced.			Married.		
	1910.	1900.	1890.	1910.	1900.	1890.	1910.	1900.	1890.
Total:									
Male	38.7	40.2	41.7	60.8	59.4	58.1	55.8	54.5	53.9
Female	29.7	31.2	31.8	70.0	68.6	68.1	58.9	57.0	56.8
Native white—Native parentage:									
Male	38.1	39.7	40.1	61.3	59.8	56.3	56.3	55.0	55.4
Female	29.9	31.0	30.6	69.8	68.8	69.3	59 4	57.7	58.2
Native white—Foreign or mixed parentage:									
Male	50.2	54.5	61.9	49.5	45.3	38.0	46.3	42.7	36.2
Female	41.7	44.4	51.0	58.1	55.6	49.0	51.1	49.4	44.3
Foreign-born white:									
Male	31.8	29.4	32.1	67.8	70.3	67.6	62.1	63.8	62.2
Female	18.3	19.5	20.7	81.6	80.3	79.2	66.5	64.2	63.9
Negro:									
Male	35.4	39.2	38 8	64.0	60.2	60.0	57.2	54.0	55.5
Female	26.6	29.9	30.0	73.1	69.9	69.8	57.2	53.7	54.6

The proportion married of both sexes in the total population has shown an increase at each decade from 1890 to 1910. For the native whites of native parentage the proportion married in 1900 was lower for both sexes than in 1890, but in 1910 the proportion had become higher than in 1890. The most rapid increase in the proportion of married is shown for the native whites of foreign or mixed parentage. Among the males of this group the proportion married in 1910 exceeded

that in 1890 by over 10 per cent. while the increase for females had been considerable. For the foreign born white males the proportion married in 1910 is lower than in 1900 or 1890 while for females the proportion married has increased steadily since 1890. The proportion married for negroes is higher in 1910 than in 1890 while the corresponding figures for 1900 were lower than in 1890.

TABLE X.

PERCENTILE DISTRIBUTION BY MARITAL CONDITION OF THE POPULATION OF CONTINENTAL UNITED STATES CLASSIFIED BY AGE PERIOD AND SEX, 1890–1910.

Age Period and Sex.	Per Cent. of Persons in Specified Age Group Who Were								
	Single.			Married, widowed, or divorced.			Married.		
	1910.	1900.	1890.	1910.	1900.	1890.	1910.	1900.	1890.
15 years and over (a)									
Male	38.7	40.2	41.7	60.8	59.4	58.1	55.8	54.5	53.9
Female	29.7	31.8	31.8	70.0	68.6	68.1	58.9	57.0	56.8
15 to 19 years:									
Male	98.3	89.8	99.5	1.2	1.0	0.5	1.1	1.0	0.5
Female	87.9	88.7	90.3	11.6	11.2	9.7	11.3	10.9	9.5
20 to 24 years:									
Male	74.9	77.6	80.7	24.6	22.1	19.2	24.0	21.6	18.9
Female	48.3	51.6	51.8	51.4	48.3	48.1	49.7	46.5	46.7
25 to 34 years:									
Male	35.0	37.3	36.8	64.7	62.5	63.1	62.8	60.6	61.5
Female	20.9	22.6	20.7	79.0	77.3	79.2	75.1	73.0	75.2
35 to 44 years:									
Male	16.7	17.0	15.3	83.1	82.9	84.5	79.2	78.8	80.9
Female	11.4	11.1	9.9	88.5	88.8	90.1	80.1	79.5	80.6
45 to 64 years:									
Male	10.1	9.3	8.2	89.7	90.6	91.6	80.6	81.3	83.5
Female	8.0	7.4	6.6	91.9	92.5	93.3	70.0	68.6	68.8
65 years and over:									
Male	6.2	5.7	5.6	93.5	94.0	94.2	65.6	67.1	70.5
Female	6.3	6.0	5.6	93.4	93.8	94.2	35.0	34.2	35.4

(a) Includes persons of unknown age.

The principal points brought out by Table X are the increasing proportion married for both sexes in the age periods below 45 years, and the decreasing proportion of married among males in the age periods above 45 years. The proportion single is lower for both sexes at all ages below 35 years but is higher for females at all periods above 35 years and for males at all age periods above 45 years. This would seem to indicate an earlier age at marriage in this country

for both sexes. At the same time it is evident that the proportion single in the advanced ages is increasing.

TABLE XI.

PERCENTILE DISTRIBUTION BY MARITAL CONDITION OF THE MALE AND FEMALE POPULATION OF CONTINENTAL UNITED STATES CLASSIFIED BY COLOR, NATIVITY, PARENTAGE AND AGE PERIOD, 1890-1910.

Class of Population and Age Period.	Per Cent. Married, Widowed or Divorced.					
	Male.			Female.		
	1910.	1900.	1890.	1910.	1900.	1890.
Total:						
15 years and over (a)	60.8	59.4	58.1	70.0	68.6	68.1
15 to 19 years	1.2	1.0	0.5	11.6	11.2	9.7
20 to 24 years	24.6	22.1	19.2	51.4	48.3	48.1
25 to 34 years	64.7	62.5	63.1	79.0	77.3	79.2
35 to 44 years	83.1	82.9	84.5	88.5	88.8	90.1
45 to 64 years	89.7	90.6	91.6	91.9	92.5	93.3
65 years and over	93.5	94.0	94.2	93.4	93.8	94.2
Native white—Native parentage:						
15 years and over (a)	61.3	59.8	59.6	69.8	68.8	69.3
15 to 19 years	1.4	1.2	0.6	12.8	12.5	11.0
20 to 24 years	27.0	23.8	20.5	53.2	51.2	51.5
25 to 34 years	68.5	65.7	66.6	80.4	79.0	80.8
35 to 44 years	85.3	85.1	86.5	89.2	89.0	89.5
45 to 64 years	90.9	91.7	92.6	91.7	91.7	92.3
65 years and over	94.0	94.6	94.8	92.4	92.8	93.3
Native white—Foreign or mixed parentage:						
15 years and over (a)	49.5	45.3	38.0	58.1	55.6	49.0
15 to 19 years	0.3	0.3	0.1	5.1	5.0	4.2
20 to 24 years	15.4	13.1	11.0	36.9	35.0	34.6
25 to 34 yeras	55.9	52.5	55.3	69.2	68.5	71.4
35 to 44 years	77.2	78.1	80.6	82.1	83.9	87.1
45 to 64 years	85.7	86.9	88.9	87.6	89.8	91.5
65 years and over	90.9	92.2	93.6	91.3	91.9	92.3
Foreign-born white:						
15 years and over (a)	67.8	70.3	67.6	81.6	80.3	79.2
15 to 19 years	0.8	0.7	0.3	13.2	11.0	8.4
20 to 24 years	19.2	17.3	15.1	54.9	46.5	45.2
25 to 34 years	60.3	60.9	58.1	81.9	80.7	80.1
35 to 44 years	82.5	82.0	82.2	91.4	91.6	91.7
45 to 64 years	89.1	89.5	90.3	94.2	94.4	95.1
65 years and over	92.6	93.0	93.2	95.3	95.6	96.0
Negro:						
15 years and over (a)	64.0	60.2	60.0	73.1	69.9	69.8
15 to 19 years	2.3	1.8	0.9	18.1	16.6	15.0
20 to 24 yeras	39.6	35.1	34.2	64.8	60.0	61.7
25 to 34 years	74.5	71.6	74.7	85.3	82.4	94.8
35 to 44 years	87.5	86.5	88.5	92.8	91.9	92.4
45 to 64 years	93.7	93.3	93.9	95.4	95.1	95.2
65 years and over	95.5	95.0	94.3	95.9	95.2	95.3

(a) Includes persons of unknown age.

For the native whites of native parentage of both sexes the proportion married, widowed and divorced is higher in 1910 than in 1900 at all age periods below 44 years, and lower than in 1890 or 1900 at all age periods above 45 years. For

the native whites of foreign or mixed parentage the proportion who are or have been married is higher in 1910 than in 1900 at all age periods below 34 years and lower than in 1890 or 1900 at all age periods above 34 years. For the foreign born white the most striking change has been in the rapid increase in the proportion married, widowed, and divorced under 25 years. The negroes show an increase in the proportion married, widowed, and divorced for both sexes at all ages.

Summary.

The Census of 1910 shows a greater proportion of males in Continental United States than any previous census since we became a nation. The number of states to show an excess of females is diminishing. This seems to be due to the unprecedented immigration of the past decade together with the extremely large proportion of males in this immigration. The states with the smallest proportion of males show an increase in this proportion since 1900, while the states with the largest proportion of males have, in many cases, shown a decrease in this proportion.

There has been a decrease since 1900 in the proportion of the population in the early age groups and an increase in the proportion in the upper age groups. The foreign born whites furnish the only exception to this rule. This will probably be reflected in a higher average and median age of the population in 1910 than at any previous census. The proportion of married is higher in the age periods of early middle life and lower in the advanced ages. This would indicate a tendency in this country to earlier marriages although the proportion single in advanced ages is greater than in 1890 or 1900.

THE GERMAN STATISTICAL SOCIETY AND ITS ANNUAL MEETING IN BERLIN, OCTOBER, 1912.

By Dr. Eugen Würzburger, *Geheimer Regierungsrat.*

Translation by John Koren.

While in almost all countries in which statistical work is carried on and statistical offices exist, the persons interested in statistics have banded together in separate scientific associations, and while twenty-seven years ago the nationally distinct societies in a sense became welded together through the International Statistical Institute, nothing of a corresponding nature existed in Germany until recently, although its numbers of official statisticians as well as of active teachers of statistics exceed without exception those of all other countries.

The explanation of this fact, which must seem the less explicable because in Germany not only one but several associations have been founded for each branch of science, some of local and some of a general character, lies principally in the circumstance that there has been no lack of opportunity for the different separate groups of statisticians to meet for consultation. First of all mention must be made of the numerous conferences of statisticians throughout the empire and in the different states, which began at the time of the foundation of the empire and the establishment of a central statistical bureau at Berlin. The object of these conferences was originally confined to the preparation for the Bundesrat of bills relating to the census of population; but soon their consultations were expanded to include other activities, whether of a temporary or continuous character, affecting the whole empire; and since 1897 such conferences have taken place annually. They have a strictly official character and are only frequented by representatives of the official statistical bureaus of the empire and of the individual states, and exceptionally by representatives of other departments who may be especially interested in some other statistical undertaking.* There is no

*For a history of these conferences, see an article by Zimmermann in "*Deutsches Statistisches Zentralblatt*" 1910, Nos. 1 and 2.

permanent organization of these conferences. Furthermore, in the large cities having their own municipal statistical offices, the directors of these began as long ago as in 1879 to hold meetings for consultation. Later on these meetings were convened according to need, and since 1899 annually. In the year 1903 they were organized under the name "*Verband deutscher Stadtestätistiker*," the principal object of which is to expedite matters of business, the consideration of personal questions being excluded.*

The dual nature of these two kinds of conferences made evident the need of a common meeting ground; for although the immediate objects of both, corresponding to their official character, related to matters of practical administration, they naturally often felt obliged to consider in a very thorough manner various theoretical questions connected with statistical activities, and while no intimacy existed between the groups, they were often brought together in the course of their official duties. The instructors in statistics in the *Hoch Schule* as well as professional statisticians in private positions or wholly in scientific pursuits lacked altogether a common bond as well as an opportunity to join their colleagues engaged in administrative statistical work.

Yet all these different groups stand in close relation to science. The statisticians occupied in administrative work, as well as those in the service of private corporations (insurance companies, etc.) gain the height of usefulness by carrying out their problems in a scientific manner, and at the same time they furnish material to statisticians in the academic lecture rooms as well as to other "statisticians" who are active in a literary way, and who carry on a further systematic study and analysis of the statistical material.

Thus the need of bringing together in one organization all persons who in a larger sense (limited only by the demand of a scientific treatment of the problems) must be considered as "statisticians" lay in the very nature of their work.

The many-sidedness of the field of work occupied by German statistical bureaus helped indirectly to instigate a closer union. It is well known that in Germany, as well as in some other parts

*See Landsberg in "*Deutsches Statistisches Zentralblatt*" 1911, No. 1.

of Europe, these bureaus are usually called upon not only to deal with the population statistics of the state or of the city maintaining such a bureau, but as a rule with all branches of administrative statistics, except those of a purely technical kind, and especially with those lying within the social and economic domain. This many-sidedness of the interests caused the administrative statisticians to be drawn into very many different scientific and professional organizations whose activity related in some manner to official statistics. The resulting division of forces made it the more desirable to join a single one of these organizations bearing especially extensive relations to statistics, namely, the "*Deutsche Gesellschaft für Soziologie*," as this society resolved in the fall of 1910 to establish independent sections according to their character. On February 10, 1911, the evening before the 70th birthday of the Nestor of German statistics, Georg von Mayr, at a meeting held in his home at Munich a committee was formed to make the necessary preparation for the formation of the "*Deutsche Statistische Gesellschaft*" as the first of these sections.

A meeting was called in conjunction with the sittings of the Union of German statisticians at Dresden where on June 17, 1911, the "*Deutsche Statistische Gesellschaft*" was founded with 100 members. This number was soon increased to 124, and Dr. Georg von Mayr was elected as its president. According to its fundamental law, membership can only be obtained by election, and, moreover, solely by persons who "have been or are active in an academic, administrative, or private capacity as statisticians, including those who are principally concerned with the use of the statistical method in special fields." The society is, however, not limited to persons who are subjects of the German empire, but is open to German statisticians of all countries. This was necessary on account of the scientific aims of the society, as well as because of the fact that the statisticians in German-speaking neighboring countries, who, although they hold conferences similar to those taking place in Germany for official purposes, are not numerous enough to form their own scientific societies.

According to the by-laws, a meeting of the members of the society must be held at least once in two years; but it is the

intention that the second annual meeting, which occurred on the 22d or 23d of October, 1912, in Berlin, should be followed in 1913 by a third meeting. In connection with the meetings lectures are given on scientific questions touching as little as possible upon the domain of practical work in handling statistical material.

The first meeting at Dresden in 1911 was for the greater part so taken up with matters of organization that time was left for but two lectures, one on marriage statistics and one on the teaching of statistics in the *Hoch Schule*; but the largely attended meeting in Berlin during October, 1912, offered a rich program.

Only one matter relating to statistical phenomena was considered, namely, the recent marked decline in the birth-rate, on which Professor Oldenberg (Greifswald) spoke. As is known, this decline has so far hardly affected the growth of population in the German empire because it is fully offset by a contemporaneous decline in mortality, especially among children during their first year of life. During the discussion there arose a difference of opinion as to whether, according to the opinion of the lecturer and others, early and permanent changes in these conditions are to be expected of unfavorable character in both directions, so that while the birth-rate may decline further this is not to be expected with any degree so far as mortality is concerned, judging from present indications. Especially instructive was the declaration of Professor Bortkiewiecz (Berlin) that 2.4 children to each marriage is sufficient to maintain the stability of population according to the present average length of life.

Doctor Wilms, mayor of the city of Posen and member of the Prussian upper house, spoke of the position of statistics and of statistical offices within the state and local administrative departments. He advocated particularly the decentralization of statistics as far as possible; that is, he would have provincial offices for smaller fields which should be delegated to gather and prepare statistics for these localities.

The consultations in regard to statistical instruction in the *Hoch Schule* were continued, having as basis an extensive material relative to the lectures on statistics in the 48 *Hoch Schulen* in which the German language is the medium of teach-

ing, gathered by a committee appointed at the preceding meeting through circulars directed to the various instructors. This material was presented to the Berlin meeting in printed form, together with the desires expressed by the instructors in regard to the proper means of teaching and learning, the question of the examination in statistics, the introduction of compulsory courses, the establishment of practical courses for administrative officials, of popular courses in statistics (university extension), etc. Both reporters on this subject, Professor Doctor Schmid (Leipzig) and Director Doctor Wolf (Halle), paid special attention to the question whether and how far the attendance upon statistical lectures should be made obligatory. The reporter for the part of the programme relating to graphic-statistical exhibits was Doctor Roesle (Dresden) than whom very few have had greater opportunity for practical experience in designing statistical graphs. For a number of years he has been at the head of a bureau whose business it is to prepare the material of demographic and medical statistics of all countries and cities for exhibition purposes by means of graphs. Doctor Roesle considered all the technical and scientific principles relating to his subject.

The Berlin representative of the Hollerith Machine Company, Civil Engineer Williams, and the inventor of another tabulating machine, Chief Engineer Haggenmiller (Munich) gave lectures on the technique of tabulating. Both speakers demonstrated the operation of their electrical apparatus.

Doctor Jaeckel (Charlottenburg) emphasized the need of a central statistical library for all scientifically active statisticians who have not access, or at least not a sufficient one, to publications relating to their profession and offered the resolution that the subject be referred to the officials of the society for further consideration.

The meeting was largely attended from all parts of the German empire as well as from Austria and other neighboring countries. The impression was apparently gained by all participants that the newly created association has shown itself to be a much-needed means of uniting the statisticians and a centre for all scientific statistical efforts.

A detailed report of the sessions will appear in the minutes to be published in the "*Deutsche Statistisches Zentralblatt,*" in the number for December, 1912, or for January, 1913.

A MEASURE OF THE MANNER OF LIVING.

By Clarence Arthur Perry, *of the Russell Sage Foundation, formerly a Special Agent of the United States Immigration Commission.*

It is not necessary to produce arguments to show what an important part variations in the manner of living play in hindering the assimilation of immigrant races; nor conversely how much more rapidly those races are absorbed into a new environment which quickly adopt the native ways of eating, sleeping, and keeping house. Great similarity in these respects may prevail and races still be kept apart by religion or color. But on the other hand, with these latter barriers out of the way and other conditions favorable, there will still be no amalgamation of those races which show violent contrasts in their modes of living. Indeed assimilation is so vitally dependent upon similarity of household life that it may almost be expressed in the terms of the latter.

It follows that in any inquiry into the comparative assimilability of immigrant races an endeavor should be made to discover in what degree their manners of living are approaching those of the native race. To do this with any accuracy some method is needed for evaluating the manner of living.

Any method of a purely descriptive character may be dismissed at once. There would need to be as many descriptions as there are differences in homes, and those are countless. There would be so few identically the same that summation would be impracticable and hence comparison impossible.

The only method which could give results suitable for statistical purposes would have to fix a standard manner of living and possess means for expressing in the terms of that standard the degree in which the household life under measurement approached it. Such a method is suggested in the following pages.

The theory upon which it is based is that the fundamental processes of household life are preparing food, eating, sleeping, and receiving friends. If a family could afford only one room, that room would usually be a kitchen. If it could afford two rooms, the second would generally be the bedroom, if three rooms the third would generally be the dining-room, and if four rooms, the fourth would generally be the parlor. The kitchen, dining-room, and parlor mark the more important stages in the development of the modern household.

It is believed that the ideal toward which American families tend is that of having separate apartments and a separate and suitable equipment for carrying on each of the fundamental household activities. In the following table there is presented a tentative list of the articles for each room which would be necessary to carry on these fundamental processes in accordance with a certain minimum standard of decency and comfort.

The numbers in the middle column (WT.) opposite each of the articles represent the arbitrary weights which have been given them. In the other columns (CK. and RT.) are spaces for check marks and ratings. The numbers given in the parentheses represent additional values which may be credited when these articles are possessed, while the numbers under the column headed weight (WT.) represent the articles which the standard requires the household to possess.

I—KITCHEN.

Articles.	CK.	WT.	RT.
Stove		4	
Gas Stove (7)			
Table		3	
Tin closet		3	
Cupboard		3	
Cabinet (7)			
Sink		4	
Chair		1	
Bench (1)			
Oilcloth on floor		4	
Window shades		2	
Wash Basin		1	
Refrigerator (10)			
Heating plant in cellar (2)			
Total weight and rating of Kitchen		25	

II—DINING-ROOM.

Articles.	CK.	WT.	RT.
Dish Closet		6	
Table		6	
Sideboard (10)			
Table cover, white		5	
" " of oilcloth (2)			
" " ..colored (3)			
Carpet		12	
Oilcloth (5)			
Rug (15)			
Window shades		3	
Curtains (6)			
Pictures		3	
Pictures Framed (6)			
Lamp		5	
Seating (Rating $= \frac{\text{No. of chairs}}{\text{No. of family}} \times 10$)		10	
Sewing Machine (5)			
Cradle (5)			
Refrigerator (10)			
Total weight and rating of Dining-Room		50	

III—PARLOR.

Articles.	CK.	WT.	RT.
Table		13	
Lamp		10	
Couch or Lounge		15	
Divan or Sofa (17)			
Carpet		15	
Rug (20)			
Curtains		12	
Window shades		6	
Chair, Rocker		8	
Easy chair (12)			
Chair		5	
" Upholstered (10)			
Chair		5	
" Upholstered (10)			
Chair		5	
" Upholstered (10)			
Pictures		6	
" Framed (12)			
Organ (20)			
Piano (40)			
Plants (15)			
Bookcase (18)			
Writing desk (18)			
Total weight and rating of Parlor		100	

IV—BEDROOM.

Articles.	IV.			V.			VI.			VII.		
	CK.	WT.	RT.	CK.	WT.	RT.	CK.	WT.	RT.	CK.	WT.	RT.
Bureau	....	4	....	....	4	....	....	4	....	....	4	....
Mirror	....	2	....	....	2	....	....	2	....	....	2	....
Washstand	....	3	....	....	3	....	....	3	....	....	3	....
Wash bowl	....	5	....	....	5	....	....	5	....	....	5	....
Pitcher or faucet (7)	....	5	....	....	5	....	....	5	....	....	5	....
Clothes closet	....	4	....	....	4	....	....	4	....	....	4	....
Wardrobe (6)	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Window shades	....	2	....	....	2	....	....	2	....	....	2	....
Curtains (6)	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Carpet	....	4	....	....	4	....	....	4	....	....	4	....
Rug (6)	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Chair	....	1	....	....	1	....	....	1	....	....	1	....
Rocker (2)	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Bed	....	5	....	....	5	....	....	5	....	....	5	....
Single (3)	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Single (3)	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Cradle (5)	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Totals	....	35	....	....	35	....	....	35	....	....	35	....

(NOTE—Investigator will check in as many of these columns as there are bedrooms used by this family, but it will be charged with a total weight equal to the number of bedrooms required by the rule for the given list of occupants multiplied by 35.)

RECAPITULATION.

	Weights.	Ratings.*
Kitchen	25	....
Dining-room	50	....
Parlor	100	....
Bedrooms (Weight = No. of bedrooms required by the rule for the given number of occupants × 35	....	....
Totals		

$$\text{Index} = \frac{\text{Total Ratings}}{\text{Total Weights}}$$

The use of the measure requires no questioning on the part of the visiting investigator or even a disclosure of his purpose. He obtains permission to go through the house—a matter which the experience of government agents shows is easily accomplished by a bit of diplomacy—and as he passes from room to room he checks off on the list the articles called for which are present. He does not make a list of any other articles which may be present. In his office the agent enters in the RT. column all the amounts in the WT. column which are accompanied by check marks on the same lines in the CK. column. If a check mark has been made on a line having an amount in parentheses instead of under WT. that amount is also entered under RT. The manner-of-living index of the household is obtained by dividing the

* Enter in this column the total rating of each of the rooms as shown in the above tables.

sum of the ratings by the sum of the required weights. The result may be either a whole number or a per cent. and is capable of summation in case the average of a large number of families belonging to the same race is desired.

The adaptation of the measure to different sized families is automatically effected by two means: (1) the seating in the dining-room, and (2) the fixing of the number of bedrooms in accordance with an arbitrary rule as to the sleeping accommodations which should be provided for a certain number of persons. In the first instance the full credit for seating is given if the dining-room shows a chair for every member of the family except possibly the baby. If a less number of chairs is found, only a proportionate part (equal to the ratio of chairs to diners) of the full seating credit is given. In regard to the requirement as to sleeping accommodations the following rule is tentatively suggested: One bedroom for a man and his wife, and possibly a baby. Another bedroom may have a maximum of four children under eight years of age. For the rest of the family there should be one bedroom for every married couple or every pair of single people of the same sex. It is believed that this requirement in the case of families having a large number of boarders would bring down the household index sufficiently to represent the diminished value of such a home life.

The measure is not designed to show a material or financial valuation of the household furnishings but rather the degree of their adequacy to the end of carrying on the fundamental living processes in accordance with a certain arbitrary standard of decency and propriety. In general the articles in the dining-room have twice the weight of the articles in either the kitchen or the bedroom and the articles in the parlor have three times the weight of the articles in the kitchen or bedroom. The purpose of this rapid increase of values is to secure widely varying per cents. for the different stages of household development, to obtain in other words a clear demarcation between the household still in the kitchen stage and the one which has reached the dining-room stage. If a household has no parlor but has parlor furniture in the dining-room such furniture is to be given only two thirds of

its standard value. If dining-room furniture is found in a kitchen it is given only half its standard value.

The method as outlined above is as yet in a tentative form. Before any application of it should be attempted the articles listed as the minimum requirement and the weights assigned to them in the above tables should be revised to conform to a standard which had been approved by a competent jury of experts in the field of domestic science and other changes in the method would undoubtedly be indicated during an experimental trial.

The attempt to represent in quantitative terms the degrees in which families have attained to a certain arbitrary standard of decency and propriety is open to the objection which can always be brought against any attempt to represent moral and intangible things in mathematical terms. In reply there can be urged the fact that in the examination system in vogue in our schools and colleges we have attempted for years, and are still attempting, to do precisely the same sort of thing.

Some of the advantages of the method which may be mentioned are the concreteness of the objects considered, the immediateness of the data, and the restriction of the reporter to decisions which allow practically no play of individual judgment, thus safeguarding the method from the vitiating effects of the personal equation. To obtain the required information the agent does not need the services of an interpreter. The material which is observed is stable; it is but slightly affected by industrial depression, temporary idleness or sickness. The completeness of the household equipment indicates with considerable accuracy the cleanliness and tidiness of the housekeeper. Since the immigrant's sobriety, industry, and thrift are reflected in the furnishings of his home it would seem that the index might be considered evidence of his desirability as a citizen.

The term "manner of living" has been used in preference to "standard of living" because the latter includes among other things a consideration of the kind and quantity of the food consumed, and it is believed that it is the *way* of eating and not the quantity of the food that is the more significant in any study of "social digestion."

REVIEWS AND NOTES.

REPORT OF DEPARTMENTAL COMMISSION ON THE OFFICIAL STATISTICS OF CANADA WITH APPENDIX CONSISTING OF NOTES OF EVIDENCE. OTTAWA, 1913.

By an Order in Council dated May 30, 1912, a Departmental Commission was appointed to inquire into the statistical work carried on in the various departments "as to its scope, methods, reliability, whether and to what extent duplication occurs; and to report to the Minister of Trade and Commerce a comprehensive system of general statistics adequate to the necessities of the country and in keeping with the demands of the time." The commission was composed of seven members and it held twenty-seven meetings, the first on June 5, 1912, and the last on November 29, 1912.

In addition to its work of ascertaining the present state of the statistics compiled by the Central Government, the Commission was charged with the duty of learning what branches of statistical work were being conducted by the provinces, "the methods used therein, results attained, and to what extent these may assist in or may duplicate work now being done by the Dominion Government."

The summary of the recommendations of the Commission are as follows:

I. The organization of a Central Statistical Office for the coördination, unification, extension and general improvement of statistics, including,—

(1) The creation of a Dominion Inter-departmental Statistical Committee.

(2) The creation of an Inter-provincial conference on Statistics.

II. The following reforms in existing statistics:

(1) DOMINION.

(a) *The Census.*—The taking of a quinquennial census and the limitation of the field of the census proper to the enumeration of population and property, with a thorough reëxamination of the methods at present in use in collecting and compiling data and in publishing results.

(b) *Production.*—The institution of an annual census of production, embracing the chief products of agriculture, forestry, fisheries, mining, and manufactures.

(c) *Trade.*—The coördination of the work of the statistical branches of the Departments of Customs and Trade and Commerce, with improvement in the classification scheme and in other details.

(d) *Transportation.*—The reorganization of canal statistics. The creation of statistics of coastal trade.

(e) *Labour.*—The creation of wages and consumption statistics.

(f) *Emigration.*—The perfecting of methods of recording departures.

(g) *Miscellaneous.*—Improvements in statistics of insurance and the development of price statistics.

(h) *Publications.*—The enlargement of the Canada Year Book. The coördination of other publications.

(2) PROVINCIAL.

The coördination of statistics on the following subjects in the light of matter set forth in the Report: births, marriages, and deaths; public health; education; agriculture; local and municipal governments; industrial accidents; various phases of production; finance; public lands; public works; and hospitals and charities.

III. The appointment of all officials engaged in statistical work on grounds of character and capacity.

This report in its details is a valuable summary of the statistics now available for Canada. More than that it is a critical analysis of the various statistical data of Canada by a body of qualified experts who do not hesitate to point out the many serious defects both of omission and commission. The great need of more complete vital statistics is emphasized as also statistics of industrial accidents. It is pointed out that at present the statistics of emigration are seriously defective as are also those of wages, household expenditure, prices, etc.

Some of the general observations made by the Commission are so universally applicable that it is worth while to quote from the report at some length:

"(1) The scope of Canadian statistics has been restricted. On not a few points of vital interest to the country, little or no statistical information exists in a form suitable for practical application. There has been no general comprehensive answer to the question, What statistics should a country such as Canada possess, *i. e.*, what are the phenomena requiring the scientific measurements supplied by statistics if Canadian national development is to proceed to the best advantage? It may be argued that the demand for statistics may be trusted to create the supply; but to wait for the occasion to arise is often to be too late, and such a policy precludes the growth of a statistical system along consistent and logical lines.

"(2) Where the statistical activities of several bodies working along similar lines are virtually independent, duplication is inevitable. The notes of evidence show many cases both of actual duplication and of serious waste of effort through lack of coöperation between statistical authorities.

"(3) The statistics are unequal in quality and value. There are instances, both dominion and provincial, of imperfect statistical method resulting from (a) lack of expert knowledge of the subject under investigation and (b) lack of appreciation of the nature and conditions of statistical measurement. The absence of leadership is nowhere more apparent than in the varying extent to which statistical methods have been developed in different branches. The whole question of reliability is involved in this. Without careful adjustment of method, accuracy is impossible. On such a

point no more severe criticism is possible than the statement that room for improvement exists.

"(4) The restriction of outlook has impaired promptitude in the issue of reports. Many statistics lose a large part of their value after a comparatively short lapse of time. Especially is this true in a rapidly growing country like Canada.

"(5) Lack of unity and coördination prevents true comparisons between Canada and other countries. The recent growth of international trade and intercourse has rendered such comparisons more than ever necessary, and they have become indispensable to the national progress of Canada."

In concluding this notice of an exceedingly interesting report attention may be directed to the schematic diagram which forms its frontispiece. This diagram is offered as a suggestion of the extent of the field to be covered by an adequate system of Canadian statistics, the several divisions being so grouped as to indicate their reciprocal relation.

F. S. CRUM.

REPORT OF THE MASSACHUSETTS COMMISSION ON COMPENSATION FOR INDUSTRIAL ACCIDENTS, JULY 1, 1912.

The final report of the Massachusetts Commission on Industrial Accidents maintains the usual high quality of official reports in that state. This commission was constituted in June, 1910, to investigate the effects of the existing laws of Massachusetts, and of other jurisdictions, relating to employers' liability; to confer with the similar commissions of other states; to draft a new compensation act; and to compile statistics. It was soon found that the commission would have to collect its own data. No bureau or office had statistics showing, in cases of fatal accidents, the extent to which others were dependent upon the deceased for support; nor showing, in cases of non-fatal accidents, whether the injuries resulted in complete or partial disability, and the duration of the disability. The commission accordingly induced 120 employers to report all accidents occuring during ten weeks. The brief period covered, the small number of establishments reporting, the resulting small number of accidents reported, and the short interval between the accidents and the printing of the statistics,—all limited the trustworthiness of any conclusions which might have been drawn from these figures. The commission, therefore, rightly regarded this inquiry as experimental only. It was seen that industries should be differently classified; that the figures should comprehend all establishments in the state; and that they should cover a longer period. The commission filed its first report in January, 1911.*

In May of the same year it submitted drafts of three bills, one providing for voluntary mutual insurance of employees by employers, and denying the three common law defenses of contributory negligence, fault of fellow servant, and assumption of risk to those employers not adopting the act; an-

* Appendix B of the final report reprints some of the tables of the first report.

other providing for compulsory compensation by employers; and the third for compulsory compensation supported by contributions of employees as well as employers. Few states have ventured to adopt a "compulsory" scheme* since the disheartening decision by the New York Court of Appeals in Ives *v.* South Buffalo Railway Co., although it is the general belief that there are few supreme courts that would have decided the same case in the same way. Massachusetts could almost surely have enacted a compulsory law without danger of its overthrow by the Court,† but chose the indirect, and probably temporary, New Jersey-Wisconsin expedient of making the law nominally voluntary, but very burdensome to non-assenting employers. The Massachusetts law has, however, many unique features which must be noted here because the chief work of the commission, since its preliminary report, has consisted in estimating the cost of compensation under the new law, enacted July, 1911, to become effective July, 1912. Assenting employers must insure in the Massachusetts Employees Insurance Association (a mutual society on the German plan), or in a regular insurance company. Employers not assenting are deprived of all effective defenses in damage suits. An Industrial Accident Board of five members administers the act. Benefits are provided for dependents of victims of fatal accidents, graded according to the wages of the deceased and the degree of dependency; like benefits for a longer period in the cases of total disability; and benefits graded according to loss of earning capacity in cases of partial disability with additional specific benefits for certain specified injuries. It is deserving of note, in passing, that the insurance rates under the Massachusetts compensation law are comparatively low. While this fact is partly due to the absence of some specially hazardous industries in Massachusetts, it is due to no small extent to the precautions taken in drawing the law, including a waiting time of two weeks during which the injured employee can claim only medical and hospital care; the specific compensation provided for specific injuries, thereby avoiding expensive litigation to determine the degree of injury; and the arrangement that the employer, not the employee, should furnish medical care, thereby avoiding a considerable amount of malingering and collusion.

Before its enactment, the measure received the approval of the Supreme Judicial Court.‡ The opinion affirms the constitutionality not only of the modification of the rules of law but also of a provision exempting employers of domestic servants and of farm laborers. The latter was undoubtedly important to the success of the bill in the legislature. Nearly all the state legislatures which have recently enacted compensation laws have exempted employers of farm laborers in one way or another, thereby testifying to their recognition of the fact that farmers as a class have not yet taken an unselfish view of their responsibilities as employers. In the case of Massa-

* The report here under review contains the text and a summary of each state compensation law, and summaries of the laws of other countries. Thus this report incidentally furnishes the most convenient summary available of recent compensation legislation.

† See brief by one of the members of the commission, reprinted in the final report, pp. 95 ff.

‡ The opinion is reproduced in Appendix C of the commission's report.

chusetts "it was thought by a majority of the commission that the conditions of domestic service and agriculture in Massachusetts did not require a change in the law." The commission did not undertake to collect accident statistics relative to farm labor, but unless conditions in Massachusetts are very unusual the view of the majority was overly optimistic. However, Massachusetts, along with her sister states, may be pardoned for yielding to political expediency in discriminating against certain of her laborers, if only the discrimination is removed when that becomes possible.

By successive resolves of the legislature authority was secured which enabled the commission to collect statistics for a period of fourteen months, every employer being required to report all accidents on blanks furnished by the commission. The report form for non-fatal accidents calls for name and location of employer, total (average) number of employees in Massachusetts, nature of business; name, sex, and age of the injured employee, home address, average weekly wages, occupation when injured, name of tool or machine by which injured; date and hour of accident, date of beginning of absence, if later than accident, nature of injury, probable period of disability, and description of accident. The supplementary report calls for date of return to work, dates of beginning lower-value work and of full-value work on the basis of wages at the time of the accident, probable duration of disability if injured employee has not returned after sixty days; and permanent result of the accident. The report for fatal accidents omits some of the specifications of the non-fatal report, and adds marital condition, number of children under eighteen, other dependents, and the extent of dependency.

The commission did not attempt to tabulate more than a small part of the data collected, but gave its data to the permanent Accident Board which will be able to make more liberal use of the material than the temporary commission conceived that it had any warrant for doing. For instance, though data were gathered as to causes, ages, and nature of injury—matters of the utmost significance in accident prevention—the commission did not report upon them, as it was not commissioned to consider the important subject of prevention.

The tables presented in the present report were prepared chiefly for the purpose of calculating the cost of compensation under the law that was about to be administered by the Accident Board. The commission has taken the utmost pains to emphasize the extreme caution with which its figures should be accepted. We are warned that they "will not serve as a safe guide for making rates in insuring individual employers," and, even in the attempt to ascertain costs by industries, we are repeatedly reminded of the short period of the investigation, of the as yet incomplete reporting of accidents, and of the constant necessity of resorting to averages and estimates (not guesses). All of these limitations will, of course, be gradually overcome as the collection of accident statistics continues.

The German classification of industries was finally adopted not only because of its technical merit, but because its adoption would facilitate comparisons with the longest and best series of accident statistics in the

world. Fortunately, it was not difficult to compare this classification with those of the Massachusetts Bureau of Statistics and the United States Census.

The tables show that only 13.71 per cent. of the manufacturing establishments of the state reported accidents during the twelve months ending April 30, 1912, but the reporting concerns apparently employed over 80 per cent. of those engaged in the industries included in the reports. During the first two months of the statistical year there was no penalty for failure to report, and no penalty was actually enforced in the remaining months. The reporting may, therefore, be regarded as reasonably satisfactory. The commission believes that a large proportion of the non-reporting establishments really had no accidents, and it is evident that imperfect reporting is one of the least serious of the problems confronting the new Accident Board. Indeed, it is suggested that many trivial accidents are being reported which may be excluded through more careful instructions to employers.

In attempting to estimate the cost of compensation under the new law, the commission prepared tables aimed to disclose the cost of medical and hospital service, of compensation in the cases of fatal accidents, of compensation for specified injuries, and of that for disability. The commission points out some of the grounds for postponing any conclusions which might appear to follow from the tables: For example, frequently employers could furnish no information as to dependents left in the case of fatal accidents, especially in the building trades, in engineering and excavation works, and other industries with shifting labor forces; and in nearly 4 per cent. of the non-fatal cases, the duration of the disability could not be determined.

In the final table the estimated costs of all sorts of compensation are compared, industry by industry, with the estimated pay-roll in each industry, to obtain the "net" cost per $100 of pay-roll. (Net cost here excludes provision for prevention of accidents as well as provision for expenses.) No rates were computed for industrial groups embracing less than 10,000 employees. In this table the highest costs are found in the building and transportation groups—the net cost per $100 of pay-roll in the building trades (which are not subdivided) being $1.65; among steam railway employees (not subdivided), $1.37; among teamsters, $1.09; and street railway employees, $1.00. Markedly lower are the rates in the most hazardous manufacturing industries—woodworking, $0.76; paper manufacturing, $0.67; gas and water works, $0.65; and iron and steel manufacturing only $0.58. The lowest rates, among the industries important enough to justify an estimate, are found in boot and shoe manufacturing, $0.14; and in printing and publishing, $0.12.

Whether or not these estimated rates prove to be anywhere near the true costs only time and experience can tell. The commission clearly had its own misgivings, and apparently some if its members questioned the wisdom of venturing upon so uncertain ground, but "a majority of the commission believes that it is justified in presenting the data that it obtained in the course of its investigations, even though fuller information derived from

experience under the new law may hereafter disclose defects not now apparent." The figures tending to show cost, though most carefully prepared, and elaborately presented, are only provisionally useful; the real service of the commission, in this as in other respects, has been to prepare the way for the continuous work of the Accident Board. This is in fact the commission's own view of its mission,—a mission which it has most faithfully performed.

WILLIAM H. PRICE.

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Scientific American Reference Book, 1913. Edited by Albert A. Hopkins and A. Russell Bond, Munn & Co., New York. Pp. 597. This book, which is somewhat larger and of more permanent value than the ordinary statistical almanac or year book, and rather less complete than a cyclopedia, consists of two distinct parts: I, "Statistical Information," and II, "Scientific Information." The former is that portion of the work which is of chief interest to statisticians. It is divided into sixteen chapters and occupies four hundred and fifty-six pages, crowded with tabulations and graphic representations of the latest data as well as those for a considerable period of time.

The chief topics which constitute chapter headings are as follows: "Population and Social Statistics; Farms, Foods, and Forests; Mines and Quarries; Manufactures; Commerce; Mercantile Marine; Railroads; The Panama Canal; Telegraphs and Cables; Wireless Telegraphy; Telephone Statistics of the World; Post Office Affairs; Patents, Trade Marks, and Copyrights; Armies of the World; Navies of the World; Aviation." These brief headings are inadequate to represent the vast amount and variety of information contained in the book, but a full index at the end of the volume, containing some seventeen hundred items, indicates the scope of the work and renders its use a matter of ease.

The data contained in the book are drawn from reliable official sources, and the editors have utilized the services of a large number of government officials and professional statisticians of established reputation in the preparation of the matter for publication.

Little has been attempted by the editors in the way of textual analysis or explanation. The tables are well constructed and the typography is excellent. In a few cases, however, in order to economize space, some of the charts and diagrams have been reduced to such small scale as to render the legends illegible. One may also feel inclined to criticize the very generous use of graphic devices of a popular, rather than a scientific character, to represent magnitudes not easily comprehended in the abstract, such as gigantic gas tanks, baskets, barrels, engines, etc.

On the whole, the book will be a useful aid to those who have neither the time nor the opportunity to consult the original sources of information.

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